

# BIOGRAPHIES & ABSTRACTS

## SMALLWOOD 2006

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Sponsored by the USDA Forest Service; Appalachian Hardwood Manufacturers, Inc.; Forest Landowners Association; Forest Products Society; Forest Resources Association Inc.; Georgia Forestry Commission; *Hardwood Market Report*; Hardwood Manufacturers Association; Healthy Forests, Healthy Communities Partnership; Mississippi State University; National Association of Resource Conservation and Development Councils; Southern Alliance for the Utilization of Biomass Resources; Southeastern Lumber Manufacturers Association, Inc.; Southern Forest Products Association; Southern Group of State Foresters; Virginia Department of Forestry; Virginia Forestry Association; Virginia Forest Products Association; Virginia Tech's Department of Wood Science and Forest Products; U.S. Bureau of Indian Affairs; U.S. Bureau of Land Management; U.S. Department of Energy; U.S. Department of Interior.

# BIOGRAPHIES

## Steering Committee Members and Session Moderators

*Richard L. Bain*  
*Group Manager and Principal Researcher*  
*National Renewable Energy Laboratory*  
*Golden, CO*

Dr. Richard Bain is Group Manager and Principal Researcher of the Thermochemical Process & Biorefinery Analysis Group at the National Renewable Energy Laboratory (NREL) in Golden, Colorado. He has 33 years' experience in the area of thermal conversion of biomass, municipal wastes, coal, and petroleum; with 19 years in biomass thermal conversion technology; 65 papers in energy conversion; and 8 patents in coal conversion, heavy oil processing, and bioconversion. Previously, he was Senior Engineer II (Chemical), Manager of the Biomass Power Program, and Senior Process Engineer, NREL; Principal, Bain & Associates; Director of Energy Development, Resource Technology Associates; Director of Research, Pentanyl Technologies; Assistant Professor, Colorado School of Mines; and Chemical Engineer, Garrett R&D Company (Occidental Research Corp.). He received a Ph.D. in Chemical & Petroleum Refining Engineering from the Colorado School of Mines.

*Charles W. Becker III*  
*Utilization & Marketing Manager*  
*Virginia Department of Forestry*  
*Charlottesville, VA*

Charles Becker is Utilization & Marketing Manager, Virginia Department of Forestry, Charlottesville, Virginia. His responsibilities include Manager of Utilization & Marketing, Resource Conservation & Development (RC&D), and Rural Economic Development Programs. He provides technical assistance for the forest products industry and promotion of new markets; provides information on the economic value of Virginia's forest and forest industry; promotes projects focused on improving utilization and developing new and value-added products for small businesses and forest landowners; promotes and provides information in areas of biomass utilization, sustainable forestry and products, invasive species utilization, and low impact and small-scale logging and processing equipment. Previously, he was Resource Conservation & Development Forester and Area Forester, Virginia Department of Forestry; Forester, USDA Forest Service; Arborist, Costello Tree & Landscaping; and Recreation Technician, USDA Forest Service. He received a B.S. from Virginia Tech, and M.S. from the University of Tennessee.

*Stephen M. Bratkovich*  
*Forest Products Specialist*  
*USDA Forest Service*  
*Northeastern Area, S&PF*  
*St. Paul, MN*

Dr. Stephen Bratkovich is a Forest Products Specialist at the USDA Forest Service, Northeastern Area, S&PF, St. Paul, Minnesota. He provides technical and administrative assistance to State forestry departments, conservation agencies, and related organizations in seven Midwest states. This assistance is in the subject areas of forest products marketing and utilization and natural resources-based economic development. He also monitors federal financial assistance grants. Prior to joining the Forest Service, he was an Assistant Professor of Natural Resources and District Extension Forestry Specialist for Ohio State University, School of Natural Resources and Ohio Cooperative Extension Service. He also worked in cooperative extension in Oklahoma and Nebraska. He received a B.S. in Forest Science from Pennsylvania State University; M.S. in Forest Economics from the University of New Hampshire; and Ph.D. in Extension & Adult Education from Ohio State University.

*Robert J. Clark*  
*Group Leader, Forest Management*  
*USDA Forest Service*  
*Northeastern Area, S&PF*  
*Durham, NH*

Robert Clark is a native of Michigan and holds a B.S. in Forestry from Michigan State University. He is a Certified Forester® by the Society of American Foresters. Mr. Clark began his Federal career in 1977 and has served on National Forests in Michigan, New York, and Vermont. His rich, diverse experience includes work with youth, the public, local and state government, industry, and the higher education community. In 2001, he accepted his current position with the USDA Forest Service, Northeastern Area. He now leads the State & Private Forestry branch of the Forest Service that delivers programs to private forest landowners, nonprofit groups, tribal nations, and communities in New York and New England. His responsibilities take him across a cultural, economic, and environmental spectrum, from the urban neighborhoods of New York City to the most rural communities of northern Vermont, New Hampshire, and Maine.

*Cornelis F. de Hoop*  
*Associate Professor*  
*School of Renewable Natural Resources*  
*Louisiana State University AgCenter*  
*Baton Rouge, LA*

Dr. Cornelis de Hoop is an Associate Professor in the School of Renewable Natural Resources, Louisiana State University AgCenter, Baton Rouge, Louisiana. His research interests include biomass utilization, timber harvesting production, and worker accidents. His teaching responsibilities include timber harvesting and timber procurement. Previously, he was Resources & Technical Services Forester, Hawaii Division of Forestry & Wildlife; Procurement Forester, Champion International Corporation; Contract Logging Supervisor, Temple-Inland Corporation; Logging Supervisor, Abitibi Paper Company; and Forester, USDA Forest Service, Daniel Boone National Forest. He received a B.S. in Forestry from the University of Kentucky; MBA from Stephen F. Austin State University; and Ph.D. from Texas A&M University.

*Bruce F. Goines*  
*Rural Community Assistance Program Leader*  
*USDA Forest Service, S&PF*  
*Vallejo, CA*

Bruce Goines is Rural Community Assistance Program Leader at the USDA Forest Service, S&PF in Vallejo, California. His responsibilities include management of Rural Development, Forest Products Conservation & Recycling, National Fire Plan, and Conservation Education programs associated with California, Hawaii, and the Pacific Islands, and serves as program lead on Lake Tahoe Erosion Control and American Heritage Rivers Initiative Programs for the Regional Office in Vallejo, California. He also serves as State & Private Forestry Staff lead for program assistance for Southern California Drought impacted counties. He is a Registered Professional Forester in the State of California. He received a B.S. in Natural Resource Management from the University of California at Berkeley.

*Gerry L. Jackson*  
*Forest Products Marketing Technologist*  
*USDA Forest Service*  
*Forest Products Laboratory*  
*Madison, WI*

Gerry Jackson is a Forest Products Marketing Technologist at the USDA Forest Service, Forest Products Laboratory, Madison, Wisconsin. He provides marketing support to forest products customers to meet the demand for sustainable rural/economic development; develops marketing plans, business plans, and strategic plans to help meet the demands of the forest product industry; evaluates marketing studies and problems for the purpose of improving rural/economic development; and provides expert advice to researchers, federal agencies, state and local governmental organization, rural communities, and the R&D industry on marketing and strategic marketing improvements. He received a B.S. in Marketing from Alabama A&M University, Master of Forestry from Virginia Tech, and MBA from Edgewood College.

*Lynn Jungwirth*  
*Executive Director*  
*Watershed Research & Training Center*  
*Hayfork, CA*

Lynn Jungwirth is Executive Director of the Watershed Research & Training Center in Hayfork, California. She was born and raised in a milling and logging family in a small timber town in Oregon. She has been an activist on social issues in forest towns for over 20 years. She served on the Collaborative Stewardship Taskforce of Forest Service Chief Mike Dombeck and on the Board of Directors for the National Network of Forest Practitioners. She also chaired the Communities Committee of the Seventh American Forest Congress from 1996 to 2000.

*Kim Kostelnik*  
*Biomass Program Manager*  
*New Mexico State Forestry Division*  
*Santa Fe, NM*

Biography not available.

*Liam E. Leightley*  
*Professor and Head*  
*Department of Forest Products*  
*Mississippi State University*  
*Starkville, MS*

Dr Liam Leightley is currently Professor and Head of the Department of Forest Products, College of Forest Resources, Mississippi State University (MSU). The Department of Forest Products has a nationally and internationally renowned research program addressing fundamental and applied wood science and technology issues. A major program being pursued is the conversion of woody biomass into bio-oil using flash pyrolysis. Dr. Leightley serves on MSU's energy committee which is charged with planning the creation of a Southern Energy Center at MSU. Dr. Leightley is the Chairman for the Southern Alliance for the Utilization of Biomass Resources (SAUBR; <http://saubr.ua.edu>). The Alliance will capitalize on the individual and combined strengths of its members to launch a biomass-based industry that will provide an economic stimulus to the rural economy in the Southern United States, and through the innovative use of our forest and farm resources, will complement the nation's Homeland Security goal of decreasing our dependence on imported oil and natural gas. Dr. Leightley is Chairman for the North Mississippi Forest Products cluster. The major focus for this cluster is the utilization of woody biomass. The Forest industry in Mississippi represents the second largest industry after poultry. The major voice for the forest industry is the Mississippi Forestry Association (MFA). Dr. Leightley serves on the MFA Board of Directors and has been working to heighten the awareness of the forestry industry to the potential opportunities for developing a sustainable woody biomass industry, concerned with the production of energy and chemicals. It is very important that the Forest Products industry remains viable, especially for the rural sector. The production of energy and chemicals from wood could provide the basis of a revitalized industry. Prior to joining Mississippi State University, Dr. Leightley held Global management positions for Rohm and Haas, a major manufacturer of specialty chemicals. He has also held positions as Visiting Professor at the USDA Forest Products Laboratory in Madison, Wisconsin and worked for many years as Research Manager in the Queensland Department of Forestry in Australia. Whilst with Rohm and Haas, he worked in Japan as a Research Department Manager, where he established a biocides research department and directed R&D for the biocides business in the Asia Pacific Region. Dr. Leightley received a Bachelor's degree in Biochemistry & Microbiology from the University of Bradford and a Doctorate from the University of Portsmouth, both in the United Kingdom. His research interests include technology transfer, utilization of woody biomass for the production of energy and chemicals and marketing. Dr. Leightley's career interests have focused on planning and directing business development policies, as well as developing new marketing initiatives, assessing new markets and analyzing business opportunities.

*Susan L. LeVan-Green*  
*Technology Marketing Program Manager*  
*USDA Forest Service*  
*Forest Products Laboratory*  
*Madison, WI*

Susan Levan-Green is Technology Marketing Program Manager, USDA Forest Service, Forest Products Laboratory (FPL), Madison, Wisconsin. She manages the USDA Forest Service, State & Private Technology Marketing Unit located at FPL. As manager, she is responsible for technology transfer of FPL research, as well as providing technical and financial assistance to forest products businesses. The unit also serves as a clearing house of information on forest products technologies, particularly technology focused on using small-diameter and underutilized species. Areas of emphasis include round-wood engineered structures, bioenergy, valued-added products, sawmilling, drying, marketing, and financial feasibility. Previously, she was Assistant Director for Wood Products Research, FPL; Budget Coordinator, Forest Service, Forest Products & Harvesting Research, Washington, D.C.; Project Leader, Fire Safety of Wood Products, FPL; Research Scientist, Fire Safety of Wood Products, FPL; and Research Assistant, Genetics Department, University of Wisconsin. She received a B.S. in Engineering Science from the University of Virginia, and a B.S. and M.S. in Chemical Engineering from the University of Wisconsin.

*Carol Lewis*  
*Executive Vice President*  
*Forest Products Society*  
*Madison, WI*

Carol Lewis is the Executive Vice President of the Forest Products Society, Madison, Wisconsin. Ms. Lewis has more than 15 years experience in the field of education and in not-for-profit organization management. She began her professional career as Assistant Plant Manager/Office Manager with Mould-Rite, Inc. in Pekin, Indiana, a producer of fine hardwood flooring and mouldings. In 1996, she joined the staff of Koetter Woodworking in Borden, Indiana and served as Project Coordinator for all facets of the design and development of The Forest Discovery Center in Starlight, Indiana. From 1997 to 2002, Ms. Lewis served as both the Executive Director of The Forest Discovery Center and the Executive Director of the Starlight Visitor's Association. In October of 2002, she left southern Indiana to join the staff of the National Hardwood Lumber Association (NHLA) in Memphis, Tennessee as Associate Executive Manager. During her tenure with NHLA, she was responsible for oversight of the operation of the 14-week NHLA Inspection School and for coordination and implementation of all NHLA educational programs.

*Richard Lewis*  
*President*  
*Forest Resources Association, Inc.*  
*Rockville, MD*

Richard Lewis is President of Forest Resources Association, Inc. (FRA) in Rockville, Maryland. His responsibilities include management and administration of all aspects of a National Trade Association representing the wood procurement and timber harvesting sectors of the Forest Products Industry; conducting projects that show the promise of improving business relationships in the wood fiber supply chain between landowners, loggers, and wood consuming companies; carrying out programs that improve the productivity, efficiency, or safety of forest management, timber harvesting and wood fiber transportation operations; and conducting continuing education programs for FRA members in the areas of improved safety and environmental performance. Previously, he was Director of Forest Resources, American Forest Council; and Senior Forester, New Jersey Bureau of Forestry. He received a Masters Level Certificate from the American University, School of Business Administration; B.S. from the State University of New York, College of Forestry; and AAS from Paul Smith's College.

*Eini C. Lowell*  
*Research Scientist*  
*USDA Forest Service*  
*Pacific Northwest Research Station*  
*Portland, OR*

Eini Lowell received a B.S. in Forestry with a Wood Science & Technology emphasis from the University of Maine, and M.S. in Forest Products from Oregon State University. Following graduate school, she worked for the Maine Department of Conservation in the Forest Products Marketing & Assessment Program. During the mid-1980's, she had her own consulting business working with biomass energy companies on resource analyses. In 1987, she returned to Oregon to work for the Forest Products Department at Oregon State University, focusing on wood quality research. In 1990, she joined the Timber Quality Research Team (now the Ecologically Sustainable Production of Forest Resources Team) as a Scientist at the Pacific Northwest Research Station in Portland, Oregon. Her work has included studies on deterioration of dead and dying trees, utilization of hardwoods, and opportunities (with a value-added emphasis) within ecosystem management for using small-diameter trees. She is currently involved in identifying ways to utilize byproducts of forest restoration treatments to reduce the cost of these management activities.

*Tad Mason*  
*Vice President, Forestry Services and Partner*  
*TSS Consultants*  
*Rancho Cordova, CA*

Tad Mason is Vice President of Forestry Services and Partner, TSS Consultants, Rancho Cordova, California. He received a B.S. in Forestry & Natural Resources Management from the University of California at Berkeley in 1979. He has 25 years experience in wildland resources management. For the last 18 years, he has been active in wildland fuels reduction, biomass fuels procurement as well as project assessment, development, and implementation. As a Registered Professional Forester, he has prepared timber harvest plans, timber management plans, fuels treatment plans and fire restoration plans. As Manager of Wood Fuel Supply with Pacific Energy/Pacific Wood Fuels Company (1987-99), he coordinated biomass fuel procurement activities in support of four biomass-fired power plants in northern California. Mr. Mason joined the partnership of TSS Consultants in 2000. TSS provides risk assessment teams to biomass project developers, owners, operators, investment banks and public agencies for developing new facilities or evaluating existing biomass utilization facilities. Mr. Mason has conducted biomass market and utilization feasibility assessments for a variety of private and public sector entities, including the USDA Forest Service, various tribal enterprises, Resource Conservation Districts and collaborative groups such as the Greater Flagstaff Forest Partnership and the Central Oregon Intergovernmental Council. He currently has projects underway in California, Arizona, and Oregon.

*Mark Nechodom*  
*Director, Social & Policy Sciences*  
*USDA Forest Service*  
*Pacific Southwest Research Station*  
*Davis, CA*

Dr. Mark Nechodom is Director of Social & Policy Sciences at the Sierra Nevada Research Center in Davis, California, a multi-disciplinary research unit of the Pacific Southwest Research Station, USDA Forest Service. He served as the Senior Social Scientist for the Sierra Nevada Framework and led the social science team in the Lake Tahoe Basin Science Assessment. Before joining the Forest Service, he spent several years on the research faculty at the University of California, Davis, where he co-founded and directed the Land Use & Natural Resources program for resource management professionals. His research has focused on the use of Life-Cycle Assessment for valuing ecosystem services and on the institutional dynamics of environmental decision-making. Dr. Nechodom spent several years as a consultant and researcher in Mexico and Latin America on agricultural and environmental policy, and is a Visiting Scholar and occasional lecturer at the University of California, Davis. He received a Ph.D. in Political Theory & Environmental Policy from the University of California, Santa Cruz.

*David W. Patterson*  
*Professor*  
*School of Forest Resources*  
*University of Arkansas*  
*Monticello, AR*

Dr. David Patterson is a Professor of Forest Products Utilization in the School of Forest Resources, University of Arkansas, Monticello, Arkansas. He received a B.S. from Pennsylvania State University, M.S. from Colorado State University, and Ph.D. from Texas A&M University.

*Matthew H. Pelkki*  
*Associate Professor*  
*School of Forest Resources*  
*University of Arkansas*  
*Monticello, AR*

Dr. Matthew Pelkki is an Associate Professor and holds the George H. Clippert Endowed Chair for Forest Resources Economics, Management & Policy at the University of Arkansas, Monticello, Arkansas. He teaches courses in forest economics, management, and private forest enterprise. He conducts research in numerical methods for stand level optimization, economics of non-industrial private forestry, and forest-based community and regional economic development. Previously, he was Associate Professor and Assistant Professor, Department of Forestry, University of Kentucky; Forestry Intern, Chesapeake Corporation; Forestry Intern, Mead-Westvaco Corporation; and Research Assistant, College of Natural Resources, University of Minnesota. He received a B.S.F from the University of Michigan, and M.S. and Ph.D. from the University of Minnesota.

*Jan Raulin*  
*Conference Manager*  
*TimberWest Publications*  
*Edmonds, WA*

Jan Raulin, Independent Consultant, has been working for TimberWest Publications since 2003 as Small Log Conference Manager. She's now organizing the third Small Log Conference scheduled for March 28-30, 2007. This biennial event pulls together information not found anywhere else. At the last conference, over 200 delegates saw high-tech mills in action, learned about how the Northwest is dealing with the forest service and environmentalists, and were able to talk to equipment dealers and wood project manufacturers. In 2007, the goal is to provide even more insights and information about the small log industry. TimberWest has been reporting on the forest industry in the greater Northwest for over 30 years. Reader's look to the magazine for current information and timber processing and harvesting techniques, as well as new, legislation and events. The decision to combine the magazine's insight with Jan's enthusiasm, drive, and over 16 years of experience in communications, marketing, event management, and forest trade shows has proven to be a great match in delivering the forest industry an exciting and valuable Small Log Conference.

*Craig Rawlings*  
*Smallwood Enterprise Agent*  
*Montana Community Development Corporation*  
*Missoula, MT*

Craig Rawlings is Montana Community Development Corporation's (MCDC) Smallwood Enterprise Agent (SWEAP). Mr. Rawlings is an entrepreneur whose family spent years in the timber industry. He has over 30 years experience in business ownership. Working for SWEAP, Mr. Rawlings establishes connections with wood products business owners. His approach is to look for even the smallest way to connect one business to another, or to find a research or financing resource that could move smallwood forward just a little, working the "middle ground" between business, research, new markets, and the USDA Forest Service. In this way, and by focusing on projects with viable business potential at a commercial scale, Mr. Rawlings and his partners have been successful. Previously, he was President and CEO, Safe Shop Tools, Inc.; President, Lifting Technologies Inc.; Vice President and General Manager, Rawlings Construction Company; and Resident Manager, Montana Pacific International.

*Rob Rizzo*  
*Director of Facilities Administration*  
*Mount Wachusett Community College*  
*Gardner, MA*

Rob Rizzo is Director of Facilities Administration at Mount Wachusett Community College in Gardner, Massachusetts. His responsibilities include project manager for the College's biomass Combined Heat & Power downdraft gasification project; project manager for the College's wind turbine project; development of renewable energy courses for students; renewable energy outreach coordinator; coordinator of the College's preventative maintenance program and College's inventory control program. Previously, he was Associate Director, Forest & Wood Products Institute, Mount Wachusett Community College; Director of the Massachusetts Wood in Transportation Program, Mount Wachusett Community College; and Procurement Forester, Berkshire Hardwoods. He received a B.S. from the University of Massachusetts.

*Robert B. Rummer*  
*Project Leader*  
*USDA Forest Service*  
*Southern Research Station*  
*Auburn, AL*

Dr. Robert Rummer is Project Leader, Forest Operations & Engineering Research Unit, USDA Forest Service, Southern Research Station, Auburn, Alabama. Previously, he was Research Engineer, Engineering Research Unit; Senior Consulting Engineer, Auburn Engineers Inc.; Research Engineer, Engineering Research Unit; and Graduate Co-op Research Engineer, Engineering Research Unit. He received a B.S. in Forest Management and M.S. in Forest Products from the University of Idaho, and Ph.D. in Industrial Engineering from Auburn University.

*Robert L. Smith*  
*Professor and Extension Specialist*  
*Department of Wood Science & Forest Products*  
*Virginia Tech*  
*Blacksburg, VA*

Dr. Robert Smith is a Professor and Extension Specialist in the Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, Virginia. He works in the area of the marketing of forest products. His specific interests include industrial marketing, strategic planning, and personal selling in the forest products industry. He teaches marketing, sales, and wood products continuing education courses throughout the U.S. He is also the Director of the Center for Forest Products Marketing & Management and is on the faculty advisory boards for the Wood-Based Composite Center and the Sustainable Engineered Materials Institute. He received a B.S. in Wood & Fiber Utilization (Forest Products) from Michigan Technological University, Master of Business Administration (Management) from the University of Wisconsin, and Ph.D. in Wood Science & Forest Products (Marketing) from Virginia Tech.

*John C. Stewart*  
*Biomass & Forest Health Program Manager*  
*U.S. Department of Interior*  
*Office of Wildland Fire Coordination*  
*Washington, DC*

John Stewart is the Biomass & Forest Health Program Manager for the U.S. Department of Interior, Office of Wildland Fire Coordination, Washington, D.C. Mr. Stewart represents the Department on biomass utilization for renewable energy under the National Energy Plan and leads the Department's efforts at smallwood utilization under the National Fire Plan. He also recently lead an Inter-Departmental team to write a joint woody biomass policy for the Department of the Interior, Department of Energy, and Department of Agriculture. Previously, Mr. Stewart was a Forest Management Specialist on the Forest & Woodland Management Group in the Washington Office of the Bureau of Land Management (BLM), U.S. Department of the Interior. He had almost 22 years of experience with the USDA Forest Service before joining the BLM. During college, he worked for Dr. Ed Stone at the University of California at Berkeley doing basic research

in seedling growth response to environmental factors and in nursery management and cultural practices. He also did research at Berkeley's Blodgett Experimental Forest in vegetation simulation modeling and plant aggregation descriptions.

*Bryce J. Stokes*  
*National Program Leader, Forest Operations Research*  
*USDA Forest Service R&D*  
*Washington, DC*

Dr. Bryce Stokes is National Program Leader for Forest Operations Research at the USDA Forest Service R&D, Washington, D.C. He received a B.S. and M.S. in Engineering from Mississippi State University, and Ph.D. in Forestry from Auburn University. He worked as a Forest Engineer for Weyerhaeuser Company prior to joining the USDA Forest Service in Auburn, Alabama as a Research Engineer. He later served as Project Leader for the Engineering Unit at Auburn and now serves as National Program Leader for Forest Operations Research as part of the Vegetation Management & Protection Research staff in the R&D Washington Office. His 20 years of research focused on harvesting machine and system design and management; biomass recovery and utilization; reducing forest operations environmental impacts; and specialty systems for pine thinning and wet area harvesting. He currently has oversight for forest operations research and is involved in carbon sequestration management, bio-based products and bioenergy, and industrial collaboration for the Agency. He currently serves as Chair of the USDA Bio-Based Products & Bioenergy Coordination Council, serves as Chair of the Federal Working Group on Woody Biomass Utilization, and serves on the USDA Energy Council. He is active in the Council on Forest Engineering, Forest Products Society, American Society of Agricultural & Biological Engineers, and the International Energy Agency. He has over 140 scientific and technical publications.

*William W. von Segen*  
*Forest Products Specialist*  
*USDA Forest Service*  
*Pacific Northwest Region*  
*Portland, OR*

William W. von Segen is a Forest Products Specialist, USDA Forest Service, Pacific Northwest Region, Portland, Oregon. As a Forest Products Specialist, he develops and promotes business opportunities for increased utilization of small-diameter and woody biomass material in the states of Oregon and Washington.

*J.M. (Mike) Washko*  
*Vice President*  
*Virginia Forest Products Association*  
*Sandston, VA*

Mike Washko is Vice-President of the Virginia Forest Products Association (VFPA), the sponsoring organization for the 30th East Coast Sawmill & Logging Equipment Exposition (EXPO Richmond). He is the Exposition Manager. Mr. Washko has been with the VFPA for 15 years. His other duties with the Association include meetings manager, Newsletter and Membership Directory ad sales/publication, and membership services. Mr. Washko came to the Association after 20 years in the hotel industry.

*John L. Wells*  
*Associate Chief Forester, Information & Education*  
*Georgia Forestry Commission*  
*Macon, GA*

John Wells is Associate Chief Forester, Information & Education, Georgia Forestry Commission, Macon, Georgia. His responsibilities include assisting the Georgia Forestry Commission Communications Department Chief. Previously, he was Associate Chief Forester, Utilization, Marketing & Development, Georgia Forestry Commission; Staff Forester, Utilization, Marketing & Development, Georgia Forestry Commission; Project Manager, International Trade, Georgia Department of Industry Trade & Tourism; Staff Forester, International Trade, Georgia Forestry Commission; and Senior Forester and Chief Ranger, Georgia Forestry Commission. He received a B.S.F. and M.S. from the University of Tennessee.

*Steve Yaddof*  
*National Community Biomass Utilization Coordinator*  
*USDA Forest Service, Cooperative Forestry*  
*Washington, DC*

Steve Yaddof is the National Community Biomass Utilization Coordinator, USDA Forest Service, Cooperative Forestry, Washington, D.C. His duties include assignments in the Community Assistance component of the National Fire Plan, and woody biomass utilization in the Healthy Forest Restoration Act, and National Energy Policy Act. He serves as the Forest Service Representative on the USDA Working Group for Resource Conservation & Development (RC&D) Policy Advisory Board. He is the Cooperative Forestry liaison to the National Association of the Conservation Districts Forestry Committee. Other duties include the Forest Service liaison with National Organizations and Foundations interested in community-based natural resource conservation and development activities. He is a 1976 graduate of North Dakota State University, Conservation of Natural Resources with a cross discipline in rural community development. Prior to working with the USDA Forest Service, his experience includes community/natural resource work in the states of Iowa, Rhode Island, and New Mexico working for the USDA Natural Resource Conservation Service in the positions of District Conservationist and RC&D Coordinator. Prior to the USDA, he worked for the U.S. Fish & Wildlife Service and held conservation positions in Iowa and Minnesota, both at the county and state level. He is a member of the Virginia Farm Bureau, Soil & Water Conservation Society, Izaak Walton League of America, Society of American Foresters, and National Association of Conservation Districts. His present hobby is serving as the secretary of his church and leading the landscape committee of his community association of 1,400 residents in Manassas, Virginia.

*G. Michael Zupko IV*  
*Executive Director*  
*Southern Group of State Foresters*  
*Winder, GA*

Mike Zupko is Executive Director of the Southern Group of State Foresters (SGSF) in Winder, Georgia. The SGSF is a not-for-profit organization representing the state forestry agencies of the 13 Southern states, Puerto Rico, and the U.S. Virgin Islands along with the leadership of the USDA Forest Service Southern Region, Southern Research Station, and International Institute of Tropical Forestry. Mr. Zupko is responsible for the coordination of all aspects of the organization including strategic planning, issues development and follow through, providing direction to staff and contractors, representing the organization on a variety of diverse issues and serving as the liaison between the organization and partners. In addition to representing the SGSF, Mr. Zupko is Principal of Zup Company, Inc., a natural resource, fire, and sportsmen's (hook and bullet) consulting firm. While the SGSF is his primary client, he also represents a golf course solutions firm, multiple hunting and fishing guides/services, and has recently worked with the International Association of Wildland Fire on various issues. He graduated from the Warnell School of Forest Resources, University of Georgia (UGA), with a BSFR degree. He also attended the University of Idaho and has done post-graduate work in management. Through the U.S. Chamber of Commerce's 4-year Institute for Organization Management program, he has completed a certificate program in organization management. Upon graduation, he served as the Georgia Forestry Association's (GFA) Governmental Relations Director, lobbying for forestry issues at the State Capitol. After departing the GFA, he represented several forestry and agricultural clients on a contract lobbying basis. He also was employed as General Manager for Trakker Technology, Inc., a firm that produces software solutions for the forest products industry in addition to working with a wood dealer and logger in Northeastern Georgia. He is a registered forester in the State of Georgia and a Certified Forester through SAF. Additionally, Mr. Zupko is currently Chair of the Warnell School of Forest Resources-UGA Alumni Steering Committee, and he serves on the UGA Continuing Forestry Resource Education Council, the Board of Directors of the UGA National Alumni Association, Jayhole Club ("Big Jayhook"), Past Chair of the Oconee Chapter SAF, AGHON, Xi Sigma Pi Honor Society, Brass Gavel Honor Society, and is a member of the Forest Landowners Association, American Society of Association Executives, International Association of Wildland Fire, International Association of Fire Chiefs, and Forest Resources Association, along with numerous

other forestry, natural resources, fire, hunting, and fishing organizations. He is a trained facilitator through the Sustainable Forestry Initiative Master Timber Harvester program in Georgia. He was selected as the Inaugural recipient of the WSFR-UGA Young Alumnus Award in 1999.

## **Session Speakers and Poster Presenters**

*Thomas T. Adams*  
*Director*  
*Faculty of Engineering Outreach Service*  
*University of Georgia*  
*Athens, GA*

Dr. Thomas Adams is Director of the Faculty of Engineering Outreach Service, University of Georgia, Athens, Georgia. His responsibilities include the development and implementation of Engineering Outreach Programs for technical and logistical assistance for the purpose of water conservation and recycling, waste minimization, byproduct recovery, and utilization for industries in the forest products, food processing, textile, and other Georgia industries. This technical assistance is being provided through on-site assessments, engineering studies, laboratory research and consultations. Technology transfer and assistance is accomplished in cooperation with all appropriate Departments in the Georgia University System. Technical assistance is focused on providing to industry and government entities water and energy conservation, waste minimization, and pollution prevention methodologies as well as byproduct recovery and value-added processes. Presentations are provided for professional and trade associations on a wide range of topics. Previously, he was Public Service Assistant, Engineering Outreach Program, University of Georgia; Research Engineer, University of Georgia; Research Assistant, University of Georgia; CEO, Tunstall Adams & Associates, Inc. Consulting Engineers; Vice President, Board Member, Carter Chambers, Inc. Petrochemical Industry Services; and Project Manager, Consulting Engineering, Proctor Davis Ray, Inc. He received a B.A. in Chemistry and B.S. in Chemical Engineering from the University of Kentucky; and M.S. in Agricultural Engineering and Ph.D. in Biological & Agricultural Engineering from the University of Georgia.

*Philip A. Araman*  
*Project Leader*  
*USDA Forest Service*  
*Southern Research Station*  
*Blacksburg, VA*

Philip Araman is a Research Project Leader and Scientist with the USDA Forest Service, Southern Research Station and an adjunct faculty member in Wood Science and Forest Products. He and his research project are located at the Brooks Forest Products Center at Virginia Tech. His project's research mission is to develop advanced tree evaluation and processing technologies, automated hardwood processing technologies, new or improved products made from low- and medium-grade hardwood sawtimber and nonselect species, and to develop effective wood product recovery, reuse, and recycling. They are also conducting non-timber forest products research. Mr. Araman has extensive experience in pallet production, recovery, repair, and reuse; in processing logs into lumber, and lumber into pallets, furniture and cabinet product; and in international trade of hardwood products. He received an AAS in Forestry from Paul Smith's College; B.S. in Wood Technology from North Carolina State University; and M.S. in Forest Products from Virginia Tech.

*David C. Atkins*  
*Fuels for Schools Program Manager*  
*USDA Forest Service*  
*Missoula, MT*

David C. Atkins is Fuels for Schools Program Manager at the USDA Forest Service in Missoula, Montana. He works with the private sector, both profit and non-profit businesses, state and federal agencies to achieve the goal of increasing the value and amount of woody biomass utilized. The work includes managing grant programs, providing technical assistance, developing agency strategies and tactics for accom-

plishing the goal. Previously, he was Forest Health Monitoring Coordinator, Regional Pesticide Coordinator, Zone Ecologist, Forest Planner, and District Silviculturist; all with the USDA Forest Service. He received a B.S. from Humboldt State University, and M.S. from the University of Montana.

*Scott L. Aycock*  
*Program Administrator*  
*Central Oregon Intergovernmental Council*  
*Redmond, OR*

Scott Aycock is Program Administrator, Central Oregon Intergovernmental Council, Redmond, Oregon. He is responsible for developing, administering, and implementing a broad array of programs and projects for the Community & Economic Development Department. He works on a team to identify and develop opportunities within the following areas: technical assistance and grant administration, regional transportation, industry cluster development, project development and process facilitation, and natural resource programs. He works with assorted local, state, and national; public, private, and non-profit partners to develop and implement projects. Projects he directly manages include: CROP, a national benchmark pilot project relating to public land management and wildfire risk reduction; Deschutes-Ochoco RAC, a regional stewardship grant process; BASE, a renewable and efficient energy industry cluster development project; development and implementation of COIC GIS Services; initiation and early development of the COIC Board Strategic Plan (ongoing); and various technical assistance and planning projects. Previously, he was Program Coordinator, COIC; Assistant Planner, Deschutes County, Oregon; Planner Analyst, City of Richmond, British Columbia; Researcher/Author, David Sukuki Foundation and Ecotrust Canada; and Assistant, North Carolina Governor's Office. He received a B.A. in Public Policy from the University of North Carolina at Chapel Hill, and M.A. in Planning from the University of British Columbia.

*Theodore W. Beauvais*  
*Assistant Director*  
*USDA Forest Service, Cooperative Forestry*  
*Washington, DC*

Ted Beauvais is Assistant Director for Cooperative Forestry at the USDA Forest Service, Washington, DC. He is responsible for the Forest Legacy, Forest Stewardship, Forest Land Enhancement, and Economic Action programs; leadership of the Forest Service efforts to conserve open space including the Forests on the Edge project; and coordinator for Forest Service preparations for the 2007 Farm Bill. Previously, he was National Program Manager for the Forest Legacy Program, USDA Forest Service, Cooperative Forestry; and District Ranger, Marienville Ranger District, Allegheny National Forest, USDA Forest Service. He received a B.S. in Forest Watershed Management from Colorado State University.

*Edward M. (Ted) Bilek*  
*Economist*  
*USDA Forest Service*  
*Forest Products Laboratory*  
*Madison, WI*

Dr. Ted Bilek is an Economist, USDA Forest Service, Forest Products Laboratory, Madison, Wisconsin. He is responsible for project feasibility analysis; project planning; and general economic analysis. Previously, he was Senior Lecturer, Forestry Economics, School of Forestry, University of Canterbury; Visiting Associate Professor, College of Forestry & Natural Resources, University of Wisconsin; and Research Fellow, College of Forestry, University of Minnesota. He received a BBA in Finance & Marketing with International Business Specialization and MBA in Finance from the University of Wisconsin, and a Ph.D. in Forestry Economics from the University of Minnesota.

*Dennis L. Blanchard*  
*General Manager and Member*  
*Recovermat Mid-Atlantic LLC*  
*Halethorpe, MD*

Dennis Blanchard is General Manager and Member of Recovermat Mid-Atlantic LLC in Halethorpe, Maryland. He is responsible for all phases of this construction and demolition facility with a gross in excess of 5 million per year. Previously, he was Project Manager to General Manager and Member, Recovermat Mid-Atlantic LLC; and Project Manager and General Superintendent, Nazario Construction.

*Robert S. Bloxom*  
*Virginia Secretary of Agriculture & Forestry*  
*Richmond, VA*

As the Virginia Secretary of Agriculture & Forestry, Robert Bloxom is responsible for the Virginia Department of Forestry, the Department of Agriculture & Consumer Services, the Virginia Agricultural Council, and the Virginia Marine Products Board, agencies that previously reported to the Secretary of Commerce & Trade. Mr. Bloxom served in the Virginia House of Delegates from 1978 until his retirement at the end of 2003. He served on the Agriculture, Labor & Commerce, and Chesapeake and its Tributaries committees, and also served a term as Chairman of the multi-state Chesapeake Bay Commission. A 1959 graduate of the University of Richmond, Mr. Bloxom currently serves as President of Bloxom Auto Supply Co., Inc., in Mappsville on the Eastern Shore.

*Michael J. Burns*  
*Vice President, Operations for Market Street*  
*Energy Company*  
*District Energy St. Paul, Inc.*  
*St. Paul, MN*

Mike Burns is Vice President of Operations for Market Street Energy Company. In that capacity, he is responsible for operation of the District Energy St. Paul and District Cooling St. Paul heating and cooling systems and the St. Paul co-generation wood-fired combined heat and power plant. He received a B.S. in Mechanical Engineering from the University of Notre Dame, and an MBA from Northwestern University's Kellogg Graduate School of Management.

*Burl Carraway*  
*Assistant Department Head*  
*Sustainable Forestry & Economic Development*  
*Texas Forest Service*  
*College Station, TX*

Burl Carraway is Assistant Department Head, Sustainable Forestry & Economic Development, Texas Forest Service, College Station, Texas. His responsibilities include: implement new forest economic development program; Economic Development Team Leader; provide oversight of agency Forest Inventory & Analysis Program; identify and pursue forest economic development opportunities; provide oversight of agency water quality program; provide oversight of agency resource analysis program; communicate agency forest taxation program; and administer staff of 34 employees. Previously, he was Forest Inventory & Analysis Program Coordinator, Environmental Forestry Program Coordinator, Best Management Practices Project Leader, and Best Management Practices Forester; all with the Texas Forest Service. He received a B.S. in Biology from Furman University, and Master of Forest Resources from Clemson University.

*Qingzheng Cheng*  
*Graduate Research Assistant*  
*Tennessee Forest Products Center*  
*University of Tennessee*  
*Knoxville, TN*

Qingzheng Cheng is a Graduate Research Assistant at the Tennessee Forest Products Center, University of Tennessee, Knoxville, Tennessee. Previously, he was Graduate Research Assistant, University of Maine; and Assistant Professor, Chinese Academy of Forestry. He received a B.S. and M.S. from Northeast Forestry University, and M.S. from the University of Maine.

*Craig M. Clemons*  
*Materials Research Engineer*  
*USDA Forest Service*  
*Forest Products Laboratory*  
*Madison, WI*

Dr. Craig Clemons is a Materials Research Engineer in the Performance Engineered Composites Group, USDA Forest Service, Forest Products Laboratory (FPL), Madison, Wisconsin. For the past 15 years, he has worked at FPL developing composites from plastics, additives, and wood or other natural fibers. His areas of interest lay both in the materials science and processing of these composites. He is also the Conference Chair for the International Conference on Woodfiber-Plastic Composites in Madison, Wisconsin. He received a B.S. in Chemical Engineering, M.S. in Forestry, and Ph.D. in Materials Science; all from the University of Wisconsin-Madison.

*John F. Colquitt*  
*President*  
*Fram Renewable Fuels LLC*  
*Savannah, GA*

John Colquitt is President of Fram Renewable Fuels LLC in Savannah, Georgia. He is responsible for the development of this renewable fuels company with an emphasis on wood pellets for export to Europe. Previously, he was President, Fulghum Fibrefuels, Ltd.; Senior Vice President, Wood Chip Export and Steamship Terminal Operations, Terminal Management Inc.; Division Manager, Hercules, Inc., Forest Resources Division; and Manager of Sales, Timberline Equipment Company. He received a B.S. in Forestry from the University of Georgia, and a B.S. in Industrial Management from Georgia Tech.

*Frank W. Corley*  
*President*  
*Corley Land Services*  
*Chapman, AL*

Frank Corley has more than 25 years experience in forest operations management in the areas of harvesting, reforestation, and forest roads in Alabama. In 1998, he formed his own company which today is known as Corley Land Services. Corley Land Services, located in Chapman, Alabama, is involved in all aspects of forest operations. Prior to forming his own company, he worked 5 years as a Forest Engineer in Union Camp's R&D Department. During this period, Union Camp embarked on an intensive culture project. Mr. Corley was very involved in developing intensive culture prescriptions and the deployment of operations needed to implement the prescription. Prior to Union Camp, he worked 12 years for Rocky Creek Logging Company. He was responsible for managing conventional, thinning, night, and swamp harvesting operations. He received a B.S. in Forest Engineering from Auburn University and serves on the University's School of Forestry & Wildlife Sciences Advisory Council, Biosystems Engineering Advisory Council, and the USDA Southern Research Station's Biological/Engineering Advisory Council.

*Harry T. Cullinan*  
*Professor and Director*  
*Alabama Center for Paper & Bioresource Engineering*  
*Auburn University*  
*Auburn, AL*

Dr. Harry Cullinan is a Professor in the Department of Chemical Engineering, and Director of the Alabama Center for Paper & Bioresource Engineering, Auburn University, Auburn, Alabama. He is also President of the Pulp & Paper Education & Research Alliance. His specialty areas include pulp and paper unit operations, mass transfer and diffusion. Previously, he was Director, Pulp & Paper Research & Education Center, Auburn University; Director, Australian Pulp & Paper Institute, and Professor of Pulp & Paper Technology, Monash University; Consultant, Appleton, Wisconsin; Vice President of Academic Affairs, Academic Dean, Professor, and Senior Research Associate, Institute of Paper Chemistry; Visiting Professor, Department of Chemical Engineering, University of Manchester Institute of Sciences & Technology; and Assistant Professor, Associate Professor, Chairman, and Professor, Department of Chemical

Engineering, SUNY at Buffalo. He received a B.S. in Chemical Engineering from the University of Detroit, and M.S. and Ph.D. in Chemical Engineering from Carnegie Institute of Technology.

*Maurice Defo*  
*Visiting Scholar*  
*Department of Forestry, Wildlife & Fisheries*  
*University of Tennessee*  
*Knoxville, TN*

Biography not available.

*James H. Dooley*  
*Executive Manager*  
*Forest Concepts, LLC*  
*Federal Way, WA*

As Co-founder and CEO of Forests Concepts, Dr. James Dooley leads the development and commercialization of new uses for smallwood and biomass, and provides professional services to federal, state, and local agencies for business planning, product development, and training. The majority of his career has been focused on the application of biological engineering methods to tropical agriculture, forest, and horticulture production operations. He is a Registered Professional Engineer in the States of Washington and Hawaii. He has been awarded 6 U.S. patents. He held a number of engineering, business development, and technical management positions with major corporations including Amfac and Weyerhaeuser during a 22 year career in industry prior to forming Silverbrook Limited. Dr. Dooley was the millennial President of the Institute of Biological Engineering and is a Fellow of ASABE, the society for engineering in agriculture, food, natural resources, and related biological systems. Dr. Dooley is a member of the Board of Directors of ABET, the international organization that oversees quality assurance for undergraduate programs in engineering, technology, applied science, and computing at universities. He received a B.S. in Agricultural Engineering from California Polytechnic; M.Eng. in Agricultural Engineering from the University of California at Davis, and Ph.D. in Forest Resources and Forest Engineering from the University of Washington.

*Joy Doran Peterson*  
*Assistant Professor*  
*Department of Microbiology*  
*University of Georgia*  
*Athens, GA*

Dr. Joy Doran Peterson is an Assistant Professor of Microbiology at the University of Georgia (UGA) with expertise in fermenting a variety of different biomass types to produce fuel ethanol using bacteria and yeasts. Dr. Doran Peterson and her laboratory staff conduct pretreatment and fermentation experiments and she has been involved in engineering bacteria for specific applications by adding enzyme activities for particular processes. Her laboratory is also isolating and characterizing new organisms and enzymes from natural and man-made environments where plant material is being converted. Recent projects include ethanol production from pulp and paper sludge, pretreatment and conversion of woody biomass to ethanol, a pectin-rich biorefinery for production of ethanol and specialty chemicals, and using Georgia's warm season grasses for bio-based industrial products. She teaches senior level undergraduate and graduate courses in prokaryotic biology and professional development. She received a B.S. Ed. from the University of Georgia, and Ph.D. from the University of Florida.

*John R. Dunn*  
*Director, Cooperative Resources Management Division*  
*USDA, Rural Development Cooperatives Program*  
*Washington, DC*

Dr. John Dunn is Director, Cooperative Resources Management Division, USDA, Rural Development Cooperatives Program, Washington, D.C. He oversees a program of research and technical assistance on rural cooperative organization, finance, operations, education, and performance. The program assists rural agricultural and non-agricultural cooperatives and associations and rural residents examining strategies for development and investment. His primary

work focuses on domestic rural areas, but assistance is provided on a government-to-government basis with some developing and partner nations. He received a B.S. in Economics and M.S. in Agricultural Economics from Iowa State University, and a Ph.D. in Economics from George Washington University.

*Paul E. Frederick  
Wood Utilization Specialist  
Vermont Department of Forests, Parks & Recreation  
Waterbury, VT*

Paul Frederick is a Wood Utilization Specialist at the Vermont Department of Forests, Parks & Recreation in Waterbury, Vermont. He is responsible for providing information, education and technical assistance on all aspects of wood availability and processing from the forest to the finished product, including the use of wood for energy. Previously, he was Lamoille County Forester and Forest Management Technician, Vermont Department of Forests, Parks & Recreation. He received a B.S. in Forestry from the University of Vermont.

*Carl E. Garrison, III  
State Forester  
Virginia Department of Forestry  
Charlottesville, VA*

Carl Garrison III has served as State Forester for the Commonwealth of Virginia since November 2004. As State Forester, he is responsible for the administrative, policy, organizational development, and operational areas associated with maintaining the value of the state's forest resource. Virginia's 15.8 Million acres of forest land provide the basis for more than 248,000 forest industry jobs and provide more than \$30 Billion in annual benefits to the Commonwealth. Prior to his initial gubernatorial appointment in 2004, he was a Regional Forester for the Virginia Department of Forestry, a position responsible for 22 counties in the north-central and northwestern region of Virginia. He has also worked in private industry as a consulting forester. He received a B.S. in Forestry & Wildlife Management from Virginia Tech. He is a Certified Forester, an active member of the Society of American Foresters (SAF), and served as Chairperson for the Virginia Division of SAF.

*Stephen P. Gaty  
Senior Analyst, Natural Resources  
& Environment Team  
U.S. Government Accountability Office  
Denver, CO*

Stephen Gaty is Senior Analyst, Natural Resources & Environment Team, U.S. Government Accountability Office, Denver, Colorado. As a Senior Analyst with GAO's Natural Resources & Environment team, Mr. Gaty serves as analyst-in-charge of GAO evaluations related to federal land management issues of interest to the Congress, including stewardship contracting, wildland fire management, and woody biomass. He received a B.A. in History/Political Science from the University of Denver, and M.A. in Political Science from Duke University.

*Congressman Bob Goodlatte  
Sixth Congressional District of Virginia  
Washington, DC*

Bob Goodlatte began his 7th term representing the Sixth Congressional District of Virginia in 2004. His service to the people of the Sixth District began in 1977 when he became District Director for former Congressman Caldwell Butler. He served in this position for 2 years until 1979, and was responsible for helping folks across the District seeking assistance with or encountering problems from various federal agencies. In 1979, he founded his own private law practice in Roanoke. He was a partner in the law firm of Bird, Kinder & Huffman, working there from 1981 until taking office. During his time in Congress, Congressman Goodlatte has made a name for himself as a leader on Internet and high-tech issues. He is Co-Chair of the Congressional Internet Caucus, and Chairman of the House Republican High Technology Working Group. He was also selected by Speaker Hastert to serve on the House Republican Cyber-Security Task Force. He serves on the House Judiciary Subcommittee on

Immigration, Border Security, and Claims and as Vice Chairman of the Courts, the Internet, and Intellectual Property Subcommittee. The Judiciary Committee is well-suited to many of his legislative priorities including cracking down on spammers, curbing illegal Internet gambling, and stemming the abuse of frivolous class action lawsuits. He was given the distinct privilege of being chosen to serve as Chairman of the House Agriculture Committee in January 2003, becoming the first Agriculture Committee Chairman from Virginia since 1947. Since being elected to serve as Chairman of the Agriculture Committee, he has helped shepherd the President's Healthy Forest Initiative through the Committee process and ultimately to final passage on the House floor. He was a conferee on the 2002 Farm Bill, working to provide programs to rural Americans who are in need of a stable farm economy, while providing suburban and urban Americans with the safest, most abundant and most affordable food supply in the world. He is a graduate of Washington and Lee University School of Law, and his undergraduate degree in Government was earned at Bates College in Lewiston, Maine.

*Shawn T. Grushecky  
Assistant Director  
Appalachian Hardwood Center  
West Virginia University  
Morgantown, WV*

Shawn Grushecky is Assistant Director of the Appalachian Hardwood Center, West Virginia University, Morgantown, West Virginia. He is the author or coauthor of numerous publications and presentations. Previously, he was a Research Associate, Research Assistant III, and Research Assistant I, West Virginia University. He received a B.S. in Wildlife Management and M.S. in Forest Resources Science from West Virginia University. He is currently enrolled as a Ph.D. Student in the Wood Science & Technology Program at West Virginia University.

*A.L. (Tom) Hammett  
Professor  
Department of Wood Science & Forest Products  
Virginia Tech  
Blacksburg, VA*

Dr. A.L. (Tom) Hammett is a Professor of Forest Products Marketing in the Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, Virginia. He serves on the staff of Virginia Tech's Center for Forest Products Marketing and Management. The Center provides education programs and market information for the forest products sector. On campus he teaches courses in forest-based enterprise management, introductory natural resources, and world forestry. He heads Virginia Tech's program focused on non-timber forest products (NTFPs) and niche markets, and works on programs in forest-based enterprise development and forest products certification. Dr. Hammett currently has projects focused on the utilization and marketing of NTFPs in the Appalachian region, as well as in Nepal, South East Asia, and Central America. He moved to Virginia Tech in 1995 from the position of Research Scientist and Senior Faculty Fellow at Yale University's School of Forestry where he served 3 years as the Team Leader for a project that supported the development of Nepal's only forestry college. While in Asia his research activities focused on utilization and trade of non-timber forest products and the management of forest-based enterprises. Dr. Hammett has authored a book on trade of forest products and numerous articles and publications based on his work in the U.S. and overseas. His international work has included developing a locally managed market information systems for non-timber forest products in the Philippines, identifying value-added opportunities for NTFPs in Asia, conducting a sustainable natural resources-based enterprises training in the Dominican Republic, organizing local forest industry centers in Thailand, and coordinating the first regional training program in marketing of NTFPs for Asia.

*W. Stephen Hart*  
*Legislative Resource Specialist*  
*USDA Forest Service, Legislative Affairs*  
*Washington, DC*

Stephen Hart is the principal Legislative Affairs (LA) specialist for State & Private Forestry (S&PF), Southwestern Region, Law Enforcement & Investigation, the Farm Bill, Process Predicament, and Ecosystem Services. Previously, he was the principal LA specialist for SPRA/GPRA, budget/appropriations, and the agency's annual legislative program. Much of his work focuses on legislation and congressional testimony. He works with WO staff and field offices to draft and clear Congressional testimony for agency and department witnesses; coordinates hearing preparation, including the preparation of all briefing materials; accompany department and agency witnesses at hearings; and coordinates the drafting and clearance of post-hearing responses. He negotiates language changes to legislation with Congressional committees. He drafts and clears official agency communications, such as legislative reports, enrolled bill reports, and Presidential signing statements. He also provides agency and departmental policy makers analysis of pending and proposed legislation; respond to Congressional inquiries, including requests for legislative drafting services, and arranges meetings and briefings with Congress for WO and field officials. He often represents the Forest Service with Members of Congress and committee staffs, USDA policy staff and political leadership, executive branch officials, and interest groups on legislation affecting the agency. He is frequently invited to speak at regional and national program meetings, such as the National Lands Training, and outside organizations, such as the Brookings Institute, about the role of Legislative Affairs and Congressional relations in general.

*Jim Higgins*  
*Market Consultant*  
*Advanced Recycling Equipment Inc.*  
*St. Mary's, PA*

Jim Higgins has developed an interest in biomass over the course of his 25+ years working in the hardwood timber industry of Northwest Pennsylvania. The main focus of his career has been timber marketing and log procurement for some of the most progressive veneer and specialty sawmills in the U.S. and Europe. With the skills he developed working in and around some of the most prized timber lands in the nation, he has been fortunate to travel extensively and develop relationships in many of the finest timber regions of the country. It has been a privilege for him to develop an association with Advanced Recycling Inc. and have the opportunity to assist in marketing their Challenger Biomass combustion systems. He is convinced that biomass will be an important piece of the energy puzzle in addressing future needs of the U.S. and the world as a whole.

*Timothy P. Holmes*  
*Research Director*  
*Holmes & Associates*  
*Saranac Lake, NY*

Timothy Holmes is Research Director at Holmes & Associates in Saranac Lake, New York. Since 1989, Mr. Holmes has managed Holmes & Associates and served as Research Director. Their three main business activities are: 1) Using systematic research to illuminate the human dimensions of environmental, social, health, and economic issues. 2) Guiding communities and businesses in applying that information most efficiently and effectively to the issue at hand. 3) Exploring how the Internet can be put to work for businesses and organizations in the Adirondack North Country region. Previously, he was Research Associate, Stephen R. Braund & Associates, a social, economic, and cultural research firm in Anchorage, Alaska. He received a B.S. in Sociology from the University of Iowa and an M.A. in Sociology from the University of Idaho.

*Leonard L. Ingram, Jr.*  
*Professor*  
*Department of Forest Products*  
*Mississippi State University*  
*Starkville, MS*

Dr. Leonard Ingram, Jr. is a Professor in the Department of Forest Products at Mississippi State University, Starkville, Mississippi. He is responsible for a number of research projects related to the chemical components of wood and how they impact use of wood products. One current project involves the chemical and physical characterization of bio-oil produced from the fast pyrolysis of wood. He also teaches undergraduate wood chemistry and serves on a number of Departmental and University committees. Previously, he worked for Crosby Chemical, Inc.; Courtaulds North American, Inc.; and Union Carbide Corporation. He received a B.S. in Chemistry and Ph.D. in Physical Chemistry from the University of Southern Mississippi.

*Steve G. Jarahian*  
*President, Mulch & Soil Council*  
*General Manager, Fafard, Inc.*  
*Regional Sales Manager, Conrad Fafard, Inc.*  
*Anderson, SC*

Steve Jarahian is President of the Mulch & Soil Council, General Manager of Fafard, Inc., and Regional Sales Manager of Conrad Fafard, Inc., Anderson, South Carolina. He is responsible for all U.S. manufacturing operations for Fafard. Previously, he was in Sales, Georgia Golfand Garden; and Product Manager, Peters Fertilizer, W.R. Grace. He received a BSA in Horticulture & Agronomy from the University of Georgia.

*Thomas W. Johnson*  
*Research Engineer*  
*Southern Company*  
*Birmingham, AL*

Thomas Johnson is a Research Engineer at Southern Company in Birmingham, Alabama. Southern Company is a regional electric utility holding company, with about 40,000 megawatts of electric generating capacity in the Southeast, and is one of the largest users of coal in the United States. Mr. Johnson is responsible for managing Southern Company's Renewable Energy Technology Program, including evaluation of the use of biomass for power generation in existing and future plants. During his career with Southern Company, Mr. Johnson has been Project Manager on several alternative fuel development efforts. He has directed projects on direct coal liquefaction, coal gasification, and advanced coal cleaning. He received a Bachelor of Chemical Engineering from Auburn University.

*Tony G. Johnson*  
*Section Head, Resource Use-FIA*  
*USDA Forest Service*  
*Southern Research Station*  
*Knoxville, TN*

Tony Johnson is Section Head, Resource Use-FIA, USDA Forest Service, Southern Research Station, Knoxville, Tennessee. He is responsible for the Resource Use Section in the Southern FIA unit, which is responsible for tracking harvest and timber product output for the 13 Southern states. This entails tracking removals from FIA inventory plots, timber product output from Forest Inventory surveys conducted in cooperation with the State Forestry agencies, and a measure of logging residues from active felled-tree studies. Data from these studies are reported in various resource bulletins and the timber products output database on the FIA website at <http://srsfia2.fs.fed.us/php/tpo2/tpo.php>. Previously, he was Section Head of Resource Use, USDA Forest Service, Forest Inventory & Analysis, Knoxville; Resource Analyst and Field Supervisor, USDA Forest Service, Forest Inventory & Analysis, Asheville; Field Forester, USDA Forest Service, Forest Inventory & Analysis, Knoxville; and Range Tech, Grand Mesa National Forest, USDA Forest Service. He received a B.S. from Oklahoma State University.

*Joseph J. James*  
*President and CEO*  
*Corporation for Economic Opportunity*  
*Columbia, SC*

Joseph James is President and CEO of the Corporation for Economic Opportunity (CEO), a non-profit economic development organization that helps economically disadvantaged communities and individuals reach their economic potential. On behalf of its clients and beneficiaries, CEO designs and implements new economic development initiatives, secures funding and financing and develops and strengthens partnerships with a number of public and private entities, interested in the economic status of his clients. Mr. James successfully authored the State of South Carolina's DOE-funded Biomass Market Development Program grant proposal and is under contract with the South Carolina Energy Office to assist in the program's implementation. CEO was recently awarded a \$250,000 U.S. Forest Service Biomass Utilization Program grant to help the National Forest in South Carolina develop new markets to sell the biomass, resulting from its reduction of fire hazard material, to customers like Santee Cooper and the University of South Carolina. Mr. James is a founding member of the South Carolina Biomass Council. He is a member of the South Carolina Forestry Association and is also a founding member of the board of the Southern Association for the Utilization of Biomass Resources (SAUBR). Mr. James has spent nearly 35 years working in economic development. His experience includes top-level positions in Austin, Chicago, Columbia, Philadelphia, Richmond, and the Washington, D.C. area. He is actively involved in the South Carolina Competitiveness Initiative, serving on the Education and Workforce Task Force and in supporting the creation and operation of agribusiness and forestry-related business clusters in South Carolina.

*Karen Kovatch*  
*Co-Owner, Roundwood West Corporation*  
*Executive Administrator, Intermountain*  
*Roundwood Association*  
*Seeley Lake, MT*

Karen L. Kovatch is a co-owner of Roundwood West Corporation in Seeley Lake, Montana. Roundwood West Corporation was founded by her parents, Jan and Dave Guelff in 1972. At that time it was known as Nine Mile Posts and Rails and Ms. Kovatch grew up at the post yard west of Missoula, Montana. In 1989, the yard was relocated to its present location in Seeley Lake. She worked summers in the yard while attending college and after graduating worked 8 years in the daily operations of the mill. Shortly after their marriage in 1999, her husband Calvin joined the business. Roundwood West Corporation primarily produces doweled products including furniture-quality roundwood and fence rails. Ms. Kovatch also serves as the Executive Administrator for the Intermountain Roundwood Association (IRA). Her family has been active in the Association since its inception and beginning in 1995, she has been responsible for the IRA's quarterly newsletter. She was part of the team who created the IRA website and inputs member information for the web listings and fields contact and membership requests. She designed the latest IRA promotional brochure and organizes the annual meeting each year. Ms. Kovatch holds degrees from Western Montana College of the University of Montana in Dillon, Montana in Business, Human Resource.

*Ruth Logsdon*  
*Environmental Manager*  
*Cox Interior, Inc. / Cox Waste-to-Energy*  
*Campbellsville, KY*

Ruth Logsdon is Environmental Manager for Cox Interior, Inc. / Cox Waste to Energy in Campbellsville, Kentucky. She has been employed by Cox Interior since 1993. Her duties include overseeing all aspects of company environmental issues, ranging from water, waste, and Title V Air permitting and compliance to biomass fuel procurement and recycling efforts. She received a B.S. in Biology from Eastern Kentucky University.

*Laura F. McCarthy*  
*Western Fire & Forest Restoration Program Director*  
*The Nature Conservancy*  
*Santa Fe, NM*

Laura McCarthy is the Western Fire & Forest Restoration Program Director, The Nature Conservancy, Santa Fe, New Mexico. The Western Fire & Forest Restoration Program Director is a new position in The Nature Conservancy's Global Fire Initiative. The position is responsible for assisting TNC state chapters in the Western U.S. to implement landscape-scale strategies to restore forests with altered fire regimes. The position works closely with the Fire Learning Network and LANDFIRE teams. As part of the implementation strategy, the position works on policy issues that need to be addressed to increase the scale and scope of forest restoration. Policy efforts are targeted around appropriations, biomass utilization, performance measures and cooperative conservation. Previously, she was Southwest Region Program Director and Policy Program Director, Forest Guild; Forest Protection Program Director and Assistant Director, Forest Trust; State Director, HawkWatch International; Forest Planner, White Mountain National Forest; Forest Resources Planner, New Hampshire Division of Forests & Lands; Assistant District Ranger, White Mountain National Forest; and Policy Analyst, USDA Forest Service, Northern Forest Lands Study. She received a Bachelor of Arts from Bowdoin College and Master of Forestry from Yale University.

*Bradley D. Miller*  
*Senior Bridge Project Manager*  
*HDR One Company*  
*Missoula, MT*

Bradley Miller is the Senior Bridge Design Engineer and Senior Bridge Project Manager in charge of highway bridges, trail bridges, and miscellaneous structures in HDR's Missoula, Montana Office. Previously, he was Senior Structural Engineer, HDR; Structural Engineer, USDA Forest Service; Bridge Design Engineer/Crew Chief, Montana Department of Transportation; and Structural Engineer, Thomas, Dean & Hoskins. He received a B.S. and M.S. from Montana State University.

*Dana Mitchell*  
*Research Engineer*  
*USDA Forest Service*  
*Southern Research Station*  
*Auburn, AL*

Dana Mitchell is a Research Engineer, USDA Forest Service, Southern Research Station, Auburn, Alabama. Biomass harvesting, harvesting production studies, and logging crew scheduling are the focus of several current projects. These include time studies of mulching equipment, impacts of double-shifting crews, a CD compilation of the Unit's biomass-related publications, and an investigation into ground-based steep slope harvesting systems. She received a B.S. in Forest Management from Washington State University and M.F. in Forest Engineering from Oregon State University.

*Jimmy Mordica*  
*Deputy State Forester and Director*  
*Conservation Education & Public Outreach*  
*Mississippi Forestry Commission*  
*Jackson, MS*

Jimmy Mordica is Deputy State Forester and the Director of Conservation Education & Public Outreach, Mississippi Forestry Commission, Jackson, Mississippi. Mr. Mordica is a registered forester with the State of Mississippi, a member of the Society of American Foresters, a member of the Mississippi Forestry Association, a member of the State Tree Farm Committee and Stewardship Committee, and has worked for the Mississippi Forestry Commission for 22 years. He is the agency liaison for Emergency Management, which led to his involvement in this program. In response to Hurricane Katrina, Mr. Mordica was instrumental in the development of a task force to discuss beneficial utilization of wood waste generated by the storm.

*Omid Parhizkar*  
*Graduate Research Assistant and Ph.D. Student*  
*Department of Wood Science & Forest Products*  
*Virginia Tech*  
*Blacksburg, VA*

Omid Parhizkar is a Graduate Research Assistant and Ph.D. Student in the Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, Virginia. He is currently working with Dr. Robert Smith at the Center for Forest Products Marketing & Management. He received a B.S. from Tehran University.

*Marcia Patton-Mallory*  
*Biomass & Bioenergy Coordinator*  
*USDA Forest Service, Office of the Chief*  
*Fort Collins, CO*

Dr. Marcia Patton-Mallory is the Biomass & Bioenergy Coordinator, USDA Forest Service, Office of the Chief, Fort Collins, Colorado. She is responsible for coordinating the woody biomass efforts of the USDA Forest Service across National Forest System, State & Private Forestry, and Research & Development programs. The position provides executive liaison and coordination between the USDA Forest Service and other Federal Agencies, State organizations, and private interests. She has 25 years of Forest Service experience as: Station Director and Assistant Station Director of the Rocky Mountain Research Station, Fort Collins, Colorado; Staff Specialist in Forest Products and Harvesting Research, Washington, D.C.; and Research Engineer, Forest Products Laboratory, Madison, Wisconsin. Additional relevant experience includes Science & Technology Fellow in the U.S. Senate working on energy and natural resources issues, and internships with Weyerhaeuser Company, Tacoma, Washington. She received Honors from Colorado State University Distinguished Alumnus and USDA Emerging Leaders. Her accomplishments include over 25 published manuscripts related to engineered wood products and non-destructive evaluation of wood; led the Forest Service effort resulting in the code of scientific ethics; and developed the Strategic Framework for the Rocky Mountain Research Station, a \$40 million enterprise covering 14 States in the Interior West. She received a B.S. in Wood Science & Technology, M.S. in Civil Engineering, and Ph.D. in Civil Engineering from Colorado State University. She is a Professional Engineer in the State of Wisconsin.

*Larry Potts*  
*CEO and General Manager*  
*Warm Springs Forest Products Industries*  
*Warm Springs, OR*

Larry Potts is CEO and General Manager of Warm Springs Forest Products Industries (WSFPI). WSFPI is the for-profit lumber manufacturing enterprise of the Confederated Tribes of Warm Springs. Mr. Potts began working for WSFPI in August 1999 and since then has felt honored to work with so many great people. Prior to WSFPI, he spent 10 years at the Collins Pine Company. During his tenure with Collins, he was Vice President of California Operations and for the last 2 years with Collins was Vice President of Sustainable Resource Development. He was instrumental in the Collins Almanor Forest near Chester, California, becoming the first privately held industrial forestlands to be awarded Forest Stewardship Council certification. Mr. Potts assisted in the start up of the Colville Indian Precision Pine sawmill located in Omak, Washington and was the President of that enterprise from March 1986 through March 1990. Prior to Colville, he spent 17 years at the Louisiana-Pacific Corporation. He received an MBA from Marylhurst University, and a B.S. in Forest Management from Humboldt State University.

*H. Michael Rauscher*  
*Research Scientist*  
*USDA Forest Service*  
*Southern Research Station*  
*Asheville, NC*

Dr. H. Michael Rauscher is a Research Scientist, USDA Forest Service, Southern Research Station, Asheville, North Carolina. His responsibilities include Coordinator for the Forest Encyclopedia Network. He is the Managing Editor of this online scientific knowl-

edge management system. Previously, he was Research Scientist, USDA Forest Service, Bent Creek Experimental Forest. He received a Ph.D. from Virginia Tech.

*Charles D. Ray*  
*Assistant Professor of Wood Operations*  
*School of Forest Resources*  
*Pennsylvania State University*  
*University Park, PA*

Dr. Charles Ray is an Assistant Professor of Wood Operations, School of Forest Resources, Pennsylvania State University, University Park, Pennsylvania. His academic interests include wood products operations management; operations research; process control, simulation, and optimization; statistical quality control; relationships of wood, moisture, product properties, and environmental emissions; intelligent systems and knowledge engineering; lean manufacturing; wood industry supply chain design and optimization; industrial ecology of wood manufacturing firms; hardwood kiln drying optimization; wood industry performance and efficiency metrics; and acoustical properties of wood. He received a B.S.F. from Stephen F. Austin State University and Ph.D. from Texas A&M University.

*Mark E. Rey*  
*Under Secretary, Natural Resources & Environment*  
*USDA Forest Service*  
*Washington, DC*

Mark Rey was sworn in as the Under Secretary for Natural Resources & Environment by Agriculture Secretary Ann M. Veneman on October 2, 2001. In that position, he oversees the U.S. Department of Agriculture's Forest Service and Natural Resources Conservation Service. Since January 1995, Mr. Rey served as a staff member with the U.S. Senate Committee on Energy & Natural Resources. He was the lead staff person for the committee's work on national forest policy and Forest Service administration. He was directly involved in virtually all of the forestry and conservation legislation considered during the past several sessions of Congress, with principal responsibility for a number of public lands bills during this period. In addition, he worked on the Herger/Feinstein Quincy Library Act of 1998 and the Secure Rural Schools and Community Self-Determination Act of 2000. This latter law is considered to have been the most extensive public forestry legislation passed by Congress in 20 years. From 1992-94, Mr. Rey served as Vice President, Forest Resources for the American Forest & Paper Association. He served as Executive Director for the American Forest Resource Alliance from 1989-92. He served as Vice President, Public Forestry Programs for the National Forest Products Association from 1984-89. From 1976-84, he served in several positions for the American Paper Institute/National Forest Products Association, a consortium of national trade associations. From 1974-75, he worked as a staff assistant for the U.S. Department of the Interior's Bureau of Land Management in Billings, Montana, and Washington, D.C. He received a B.S. in Wildlife Management, B.S. in Forestry, and M.S. in Natural Resources Policy & Administration, all from the University of Michigan-Ann Arbor.

*Richard M. Schroeder*  
*President*  
*BioResource Management, Inc.*  
*Gainesville, FL*

Richard. Schroeder is President of BioResource Management, Inc. and brings over 20 years' experience in planning, developing, and operating bioenergy facilities throughout the U.S. Mr. Schroeder's experience includes governmental service and field operations of forestry and recycling firms. As Vice President of Development for a wood recycling company, he led its growth from start-up to a national company operating in over 25 locations and handling nearly 2 million tons of organics and biomass each year. Mr. Schroeder received a B.S. in Forestry and a Master's in Agriculture from the University of Florida. He also received an MBA from Nova Southeastern University. He has served as the statewide Wood Energy Coordinator for the Florida Division of Forestry, a member of the National BioEnergy Industries Association, and Chair of the Wood Energy Committee in the Florida Forestry Association. He is a member of the Florida Organics Recyclers Association and the Society of American Foresters.

*R. Daniel Seale*  
*Professor*  
*Department of Forest Products*  
*Mississippi State University*  
*Starkville, MS*

Dr. R. Daniel Seale is a Professor in the Department of Forest Products, Mississippi State University (MSU), Starkville, Mississippi. Currently, he is Project Leader for the TimTek effort at MSU. This position includes the oversight of a research and development effort to produce commercial quality beams in the pilot plant located on the MSU campus and production of code approval beams for the first commercialization effort. He received a B.S. and M.S. in Agricultural Economics from MSU, and Ph.D. in Applied Economics from Clemson University.

*Jessica M. Simons*  
*Natural Resources Specialist*  
*Southeast Michigan Resource Conservation & Development Council*  
*Ann Arbor, MI*

Jessica Simons is a Natural Resources Specialist at the Southeast Michigan Resource Conservation & Development Council in Ann Arbor, Michigan. She manages all aspects of the Council's Ash Utilization Options Project by providing support for demonstration project grant recipients, organizing training events, overseeing contracted research projects, and conducting education and outreach activities. Through this project the RC&D is working to help communities, especially those affected by the emerald ash borer, to find value in their removed urban trees. Previously, she was "Bioblitz" (Biological Features Inventory) Coordinator, The Nature Conservancy; Forester, Forest Inventory & Analysis, USDA Forest Service; and Graduate Student Instructor and Research Assistant, Forest Health Monitoring, University of Michigan, School of Natural Resources & Environment. She received a B.A. in Biology from West Virginia University and M.S. in Natural Resources & Environment from the University of Michigan.

*Edwin P. Smith*  
*Sales Manager*  
*Round Wood Systems*  
*Helena, MT*

Ed Smith is the Sales Manager for Round Wood Systems in Helena, Montana. Round Wood Systems develops and manufactures production machinery utilizing small-diameter logs for use in the post, pole, and rail industry. Previously, he was Production Manager, Montana Hydraulics, LLC.

*Peter Stark*  
*Founding Partner and Head of Marketing*  
*North Slope Sustainable Wood, LLC*  
*Missoula, MT*

Peter Stark is a Writer, Forest Landowner, Founding Partner, and Head of Marketing for North Slope Sustainable Wood, LLC, based in Missoula, Montana. Founded in 2004, this firm uses small-diameter larch trees from forest restoration sites in the Northern Rockies to manufacture high-quality tongue and groove flooring, going by the brand name of "Mountain Tamarack." Currently, as Head of Marketing, Mr. Stark is responsible for promoting North Slope's flooring in publications, seeking out distributors, overseeing publicity, sales materials and website, and planning North Slope's advertising. In addition to his work with North Slope, he has been a freelance journalist since 1983. He received a Master's in Journalism from the University of Wisconsin-Madison (1980) and a Bachelor's in English & Anthropology from Dartmouth College (1976). He has published four books and numerous articles on outdoor adventure, travel to developing countries, indigenous people and the environment in magazines such as *Outside*, *Smithsonian*, and *The New Yorker*. His most recent book is *At the Mercy of the River: An Exploration of the Last African Wilderness* (Random House-Ballantine, 1980). As the owner of 80 acres of "urban-interface" forest land adjoining the Rattlesnake National Wilderness and Recreation Area in Missoula, Montana, Mr. Stark initially set the idea for North Slope Sustainable Wood in motion

when he experimented using small-diameter larch trees culled from his forest and milled them into flooring for a backyard dance studio he was building with his wife, Amy, a professional dancer. His founding partners in North Slope are restoration forester Matt Arno and environmental lawyer Mike Wood. Mr. Stark's article on small-diameter trees, his forest restoration and flooring business was published in *Outside* magazine (August '05) under the title, *The Tree Slayer*. It was through his media contacts that an article about the use of small-diameter trees recently appeared in *The New York Times* "Science" section, "New Uses for Glut of Small Logs from Thinning of Forests" (January 10, 2006).

*Thomas N. Thomson*  
*Owner*  
*Thomson Family Tree Farm*  
*Orford, NH*

Tom Thomson and his family runs and operates the Thomson Family Tree Farm. The Thomson's have been managing their 2800 acre forest land with an emphasis on demonstrating to others the true meaning of a "working sustainable forest". After high school, Mr. Thomson served in the National Guard, and then went on to take a graphic arts course. After a short time at his father's law book publishing company, Equity Publishing, he worked for 8 years at Hanover Press. In 1975, he returned to run Equity Publishing while his father served as Governor of New Hampshire (1973-1979). The business was sold in 1989 to Reed Publishing, an international legal publisher. At this point, Mr. Thomson decided to shed his coat and tie and do what he loves best, promote good forest stewardship. Since then he has been an active advocate in promoting sustainable forestry locally, regionally, nationally, and internationally through tours, writing articles, testifying at his state capitol and the U.S. Senate, and meeting with and giving talks and slide presentations to International Conservation Professionals. Elected officials seek Mr. Thomson's advice on forestry issues that impact family forest landowners as well as the National State Foresters Association and many other organizations. He has served as Past Vice-Chair of the Tree Farm National Operating Committee and Chair of the Tree Farm National Policy Committee and today he serves on the National Sustainable Forestry Board (SFB) Resource Committee representing Family Forest Landowners throughout the U.S. He is also regional Vice President for the National Woodland Owners Association and a member of the Forest Landowners Association (FLA). He has received numerous state and national forestry awards. Most recently, he received the prestigious FLA "2005 Forest Landowner of the Year" Award. Mr. Thomson is known in the forestry community as an active, committed forestry advocate for all Family Forest Landowners.

*William S. Turner*  
*Timber Procurement Manager*  
*Timber Products Company*  
*Yreka, CA*

William Turner is Timber Procurement Manager, Timber Products Company, Yreka, California. As Timber Procurement Manager, he oversees the acquisition of land and logs needed to run a veneer mill. He works with private landowners, USDA Forest Service, and Bureau of Land Management in all aspects of land management and timber sale and harvesting activities in Northern California and Southern Oregon. He directs the purchasing and distribution of logs to various mills to maximize value and optimize utilization. He manages log yard activities handling more than 20,000 log truck and chip van loads annually. Previously, he was Log Buyer, Michigan-California Lumber Company; and Forester, Louisiana-Pacific Corporation. He received a B.S. in Forest Management from Humboldt State University.

*Mary Virtue*  
*Owner*  
*Cornerstone Consultants*  
*West Chester, PA*

Mary Virtue is Owner of Cornerstone Consultants in West Chester, Pennsylvania. Her areas of expertise include: 1) Facilitation of meetings and learning retreats. 2) Strategic planning – developed a process that incorporates web-based, telephone, and face-to-face interactions leading to a strategic plan that has been informed by multiple stakeholders. 3) Evaluation – evaluation of foundation portfolios and potential projects; assessment of state folk arts programming; community-based program evaluation for nonprofits and community foundations;

program evaluation of projects funded by the federal government; and training on ROMA (Results Oriented Management and Accountability). 4) Organizational assessment and capacity development. 5) Earned revenue – design and implementation of earned revenue ventures for nonprofits, museums, and community-based cultural centers; development of business plans and financial reports for grant requests and bank loan applications. 6) Teaching and training – strategic planning and human resources and performance management. Previously, she was President and General Manager, Artisans Cooperative, Inc.; Vice President of Administration, Carbone-Ferraz; and Marketing Assistant, Akro-Medic Engineering. She received a B.A. and B.S. in Finance from the Thomas Edison College, and MBA from Columbia University.

*Rien Visser*  
*Associate Professor, Industrial Forest Operations*  
*Department of Forestry*  
*Virginia Tech*  
*Blacksburg, VA*

Dr. Rien Visser is an Associate Professor of Industrial Forest Operations, Department of Forestry, Virginia Tech, Blacksburg, Virginia. His current research activities include international research projects in Chile, Bolivia, New Zealand, and Austria; harvest system planning, productivity, and efficiency including system modeling; cable logging and helicopter logging systems and training; woody biomass harvesting and transport logistics for bio-energy; improving value recovery and marketing in hardwood harvesting operations; minimizing environmental impacts of logging operations (e.g. streamside management); and Forest engineering (e.g. road construction and maintenance and drainage structure design). Previously, he was Assistant Professor, Department of Forestry, Virginia Tech; Scientist (Forest Engineering), New Zealand Forest Research Institute; Ph.D. Student and Teaching Assistant, Bodenkultur (University of Agricultural & Life Sciences); Senior Researcher (Project Leader, Environmental) and Researcher, New Zealand Logging Industry Research Organisation; and Research Assistant, University of California, Davis. He received a Bachelor of Engineering in Natural Resource Engineering from Canterbury University; Masters of Engineering in Biological & Agricultural Engineering from the University of California, Davis; and Ph.D. in Forest Engineering from Bodenkultur University.

*Dwayne D. Walker*  
*Vice President, Operations*  
*W.B. Contracting, Inc.*  
*Eagar, AZ*

Dwayne Walker is Vice President of Operations for W.B. Contracting, Inc. in Eagar, Arizona. They are fourth generation loggers, that own and operate a successful logging company with a rich history of family logging experience and ties to the communities of the White Mountains of Arizona. Their sister company, Future Forest, LLC are the award recipients of the largest Stewardship thinning contract in U.S. Forest Service history. The White Mountain Stewardship contract encompasses over 150,000 acres throughout the Apache-Sitgreaves National Forest. Mr. Walker's responsibilities with W.B. Contracting, Inc. is to oversee all thinning operations; marketing and development of new and established markets for wood products; and procuring contracts with the USDA Forest Service and the Department of Agriculture's thinning projects. W.B. Contracting, Inc. is a member of the Arizona Sustainable Forestry Partnership, Northern Arizona Wood Products Association, and Northern Arizona Loggers Association.

*Steven J. Walker*  
*President and CEO*  
*New England Wood Pellet, LLC*  
*Jaffrey, NH*

Steven Walker is President and CEO of New England Wood Pellet, LLC (NEWP) in Jaffrey, New Hampshire. Mr. Walker started NEWP in 1992 after realizing all the environmental benefits of pellets and learning all he could about producing a quality pellet. After seeing his first wood pellet stove and learning that the pellets were being shipped from Montana, Mr. Walker began his venture by spending many nights experimenting in his machine shop. After a few trials, he had managed to produce a handful of pellets. The story continues from there... Mr.

Walker has served on many boards and committees. He is currently an active member of Pellet Fuels Institute (PFI), The Society for the Protection of New Hampshire Forests, and New Hampshire Timber Owner's Association. He chairs the PAC Government Affairs Committee for PFI. Locally, he serves as a member on The Open Space Committee, Monadnock Business Ventures, and Jaffrey's Economical Development Committee. Most recently, he has been appointed by the Governor to the "Air Resources Council" as Manufacturing Component of Industry. Prior to starting NEWP, Mr. Walker owned and operated a successful landscaping business in Lincoln, Massachusetts.

*Anthony K. Weatherspoon*  
*Forest Products Specialist*  
*Michigan Department of Natural Resources*  
*Lansing, MI*

Anthony Weatherspoon is a Forest Products Specialist, Michigan Department of Natural Resources, Lansing, Michigan. He has 20 years of experience in providing management information, education and technical expertise and services to Michigan's forest products industry and other service providers. Other clients involved are non-industrial private landowners, cities, communities and schools. He has 7 years of supervisory experience and running quality assurance program. Previously, he was Forest Products Utilization & Marketing Specialist, Michigan Department of Natural Resources, Forest Management Division; Quality Control Supervisor, Champion International; Shipping Department Supervisor, Champion International; and Cut-Up Plant Supervisor, St Regis Paper Company. He received an Associate of Art in Social Science from Lansing Community College, and B.S. in Wood Science from Colorado State University.

*Vikram Yadama*  
*Assistant Research Professor and Extension Specialist*  
*Wood Materials & Engineering Laboratory*  
*Washington State University*  
*Pullman, WA*

Dr. Vikram Yadama joined the faculty of Washington State University's (WSU) Wood Materials & Engineering Laboratory in 2003 as an Assistant Research Professor and Extension Specialist. He has a dual appointment of research and extension within the Department of Civil & Environmental Engineering and WSU Extension. His educational background spans the fields of forestry and forest management (B.S. from Iowa State University), forest products and wood science (M.S. from Virginia Tech), and structural engineering (Ph.D. in Civil Engineering from WSU). He has extensive experience as a project leader in extension and applied research gained at Mississippi State University, where he held a research faculty position at the Forest Products Laboratory for approximately 10 years. In this capacity, he interacted frequently with the wood-based composite industry and furniture manufacturers and provided them with technical assistance. He is an active member of the Society of Wood Science & Technology and Forest Products Society. His areas of interest are wood-based composites processing and modeling and material properties evaluation.

*Martin R. Yoklic*  
*Associate Research Scientist*  
*Environmental Research Laboratory*  
*University of Arizona*  
*Tucson, AZ*

Martin Yoklic is an Associate Research Scientist, Environmental Research Laboratory, University of Arizona, Tucson, Arizona. His research interests include integrated community design for ecosystem viability – addressing water and energy conservation, air quality, waste cycling, concepts of bio-regenerative systems, industrial ecosystems and other means of environmentally sustainable land and community development in arid regions including drought and salt tolerant plants for landscape use; restorative approaches to conventional development practices including integrating energy, water, and other resource conservation technologies and strategies development projects; working with stakeholders and professionals to translate research information practice in ways that facilitate public understanding; working with the community to encourage and facilitate the adoption of sustainable

design practices into projects of various scales from individual residences to neighborhoods, from suburban center to urban infill, from large-scale rangeland to forest management systems. His education includes Engineering Curriculum at West Liberty State College; B.A. in Geography from West Virginia University; and Planning & Environmental Studies and Masters in Landscape Architecture from the University of Arizona.

*John I. Zerbe  
Volunteer, S&PF Technology Marketing Unit  
USDA Forest Service  
Forest Products Laboratory  
Madison, WI*

Dr. John Zerbe is a Volunteer in the S&PF Technology Marketing Unit, USDA Forest Service, Forest Products Laboratory, Madison, Wisconsin. As a full-time volunteer, he continues work on biomass for energy, global change, and wood as a structural material in responding to technical inquiries from industry and consumers to the Forest Products Laboratory. He holds cooperative consulting assignments with industry and academia. He works on life-cycle assessment of materials, translations of comprehensive technical documents from German to English and from English to German, and substitution of alternative tropical wood species in the manufacture of oriented strandboard, plywood, laminated veneer lumber, and engineered wood load-carrying structural members. Previously, he was Acting Program Manager, Technology Marketing Unit, USDA Forest Products Laboratory; Acting Deputy Director, USDA Forest Products Laboratory, Program Manager, Energy R, D&A, USDA Forest Service; Director, Forest Products & Engineering Research, USDA Forest Service; and Assistant Vice President, Technical Services, National Forest Products Association. He received a B.S. in Wood Utilization from Pennsylvania State University; and M.S. and Ph.D. from the State University of New York, College of Environmental Science & Forestry.

## ABSTRACTS

### OPENING GENERAL SESSION

#### **Administration's Strategy for Small-Diameter and Low-Valued Woody Material**

**Mark E. Rey**, Under Secretary, Natural Resources & Environment, USDA Forest Service, Washington, DC

Abstract not available.

#### **Small Tree Utilization and Low-Grade Markets are "Key" to the Success of U.S. Family Forest Landowners**

**Thomas N. Thomson**, Owner, Thomson Family Tree Farm, Orford, NH

Tom Thomson of Orford, New Hampshire will give a talk and slide presentation on the importance of small-diameter utilization and low-grade wood markets and how they impact this nation's family forest landowners. Tom manages the Thomson Family Tree Farm which consists of 2800 acres in both New Hampshire and Vermont with his wife Sheila and their son Stacey. Stacey owns and operates the Thomson Timber Harvesting & Trucking LLC. Tom has owned and managed woodlands since 1956 when at the age of 11, he purchased his first woodlot. Tom has great insight into the needs of all Family Forest Landowners from his experience with the following organizations. He is a member and served as Vice Chair of the National Operating Committee and Chair of the Policy Committee of the American Tree Farm System. He is a member of the National Woodland Owners Association and presently serves as the Northeast Regional Vice President for that organization. He is also a member of the Forest Landowners Association and was chosen as the recipient of the 2005 Forest Landowner of the Year Award. He will explain how utilization and good low-grade wood markets are essential to maintaining sustainable forestry throughout our nation. Representing this nation's Family Forest Landowners on the Sustainable Forestry Board Resource Committee (SFI Certification) since 2001, Tom has been consistent with his message that Family Forest Landowners need the U.S. Forest Industry and their important markets, while at the same time they need our wood fiber; we are partners and we must work

together if we are to be successful. Senior Senator, Judd Gregg of New Hampshire, says "Tom is considered one of the most influential Family Forest Landowner advocates in the U.S." Be prepared for an interesting and thought provoking talk by Tom Thomson.

### **Future of Biomass Utilization Opportunities in the South**

**Liam E. Leightley**, Professor and Head, Department of Forest Products, Mississippi State University, Starkville, MS

The 214 million acres of forestland in the Southeastern states of the U.S. offer a significant opportunity to develop renewable sources of energy and chemicals. The production of energy and chemicals from woody biomass promises to be an exciting industry of the future, providing potential new markets for forest thinning, residues, and wood waste. Such an industry would provide a significant contribution to the reduction in our dependence on fossil fuels without degrading air and water quality or compromising our timber and food supplies, while also creating jobs in rural economies. The potential for a woody biomass industry is continuing to increase as changes in the global economy cause a reduction in the demand for wood in the U.S., especially in the Southeast, where the demand for pulpwood has decreased. This has led to the local forest products industry experiencing high inventories and lower prices for small-diameter pinewood and thousands of acres of overstocked pine plantations. An energy and chemicals industry based on forest-based biomass could utilize wood considered to be unmerchantable or underutilized and could contribute to alleviating the nation's economic, energy, and environmental concerns. The large inventory of small trees could be reduced, stumpage prices could be increased, and the value of forest assets restored. The removal of such material from the forests, as pre-commercial thinning would also create healthier forests that are less susceptible to attack by destructive insects and disease. In addition to the biomass obtained from thinning, a significant volume of solid wood waste is produced by the wood products industry each year. This wood waste could also be used as a feedstock source of biomass for energy production.

## CONCURRENT SESSIONS

### SESSION IA: Legislative Opportunities

This session will offer a unique and informal insight by career staff who work daily with the balance between federal budgets, administrative policy, and Congressional interests and how these interests ultimately become active programs. The information will be as current as their last day in the office.

The Legislative Opportunities session will be an overview of the Washington, D.C. legislative activities related to the forestry aspects of the next Farm Bill, renewable energy opportunities with woody biomass, and the evolving USDA policies regarding long-term recovery and readiness for areas impacted by catastrophic events.

This session will welcome an exchange of ideas and discussion regarding future programs that will impact the development of woody biomass enterprises used as a forest stewardship tool, local, renewable energy opportunities, and the planning necessary for environmental restoration and woody biomass recovery as part of a long-term economic and social infrastructure recovery of areas impacted by catastrophic disasters.

#### **Upcoming Farm Bill Opportunities for Forestry**

**Theodore W. Beauvais**, Assistant Director, USDA Forest Service, Cooperative Forestry, Washington, DC

#### **Energy Legislation in the 109th Congress**

**W. Stephen Hart**, Legislative Resource Specialist, USDA Forest Service, Legislative Affairs, Washington, DC

#### **Long-Term Disaster Relief**

**John R. Dunn**, Director, Cooperative Resources Management Division, USDA, Rural Development Cooperatives Program, Washington, DC

## **SESSION IB: Recycling, Reclaiming, and Reusing Urban Trees, Antique Timbers, and Discarded Pallets**

### **Urban Forest Management: From Wood Waste to Energy**

**Michael J. Burns**, Vice President, Operations for Market Street Energy Company, District Energy St. Paul, Inc., St. Paul, MN

Over the last 25 years, District Energy St. Paul has developed the energy delivery infrastructure to enable development of the largest biomass-based district heating system in North America. The energy source for this system is actually three plants in one: an electrical plant, a heating plant, and a cooling plant. Its primary fuel is a plentiful, renewable local product - urban wood waste. The facility consumes more than 250,000 tons of wood waste each year. This use of renewable wood waste means less pollution, reduced reliance on fossil fuels, and cheaper energy for the community. Learn why President George W. Bush called the company "a model of energy efficiency, diversity, and affordability."

### **Reclaimed Wood: Utilizing the "Industrial" Forest**

**Dennis L. Blanchard**, General Manager and Member, Recovermat Mid-Atlantic LLC, Halethorpe, MD

Recovermat Mid-Atlantic LLC has operated a mixed construction and demolition (C&D) recycling facility for the last 10 years, and has processed over 1 million tons of C&D. Dennis Blanchard will explain why wood from this waste stream is very important to our facility and to the ADC that we produce. We are members of the Construction Materials Recycling Association, and the presentation will also describe ways that other members use and process wood reclaimed from their recycling operations. Given the current energy crisis in our country, organizations such as ours could be helpful in promoting renewable energy.

### **Recycling Discarded Pallet Parts into "Green" Flooring in North Carolina**

**Philip A. Araman**, Project Leader, USDA Forest Service, Southern Research Station, Blacksburg, VA; **Joe Pryor**, Oaks Unlimited, Waynesville, NC; **Dave Lowles**, Land-of-Sky Regional Council, Asheville, NC; and **Urs Buehlmann**, Enkeboll Designs (formerly North Carolina State University, Raleigh, NC), Carson, CA

A partnership between the USDA Forest Service, North Carolina State University, and the Land-of-Sky Regional Council, a non-profit organization in Asheville, North Carolina formed to extend some initial Forest Service R&D on making flooring from used pallet parts to commercial reality. The team conducted some more manufacturing research and conducted a study with green architects and builders to see if they agreed with the flooring products. They did like the "Green" flooring and felt that the potential customers were waiting for this type of product. We then found a wood-based company that wanted to get into the business of manufacturing and marketing "Green" flooring made from used pallet parts. We will tell the story of this adventure and tell you much of the process that Oaks Unlimited has had to go through. It has been an interesting adventure with many unusual twists and turns and now some worries. The product is 3/8" thick and prefinished with a high-grade factory finish.

**TUESDAY AFTERNOON, MAY 16**

## **CONCURRENT SESSIONS**

### **SESSION IIA: Biomass Energy Power Opportunities**

#### **Development of a Biomass Co-Generation Facility at Warm Springs Forest Products Industries – Observations/Challenges/Opportunities**

**Larry Potts**, CEO and General Manager, Warm Springs Forest Products Industries, Warm Springs, OR

Implementation of Treaty rights on designated federal lands, increasing occurrence and severity of stand replacing wild fire starting off the Reservation and coming on to the Reservation (and on the reverse), the need to address the areas of hazardous fuels build-up on the Reservation, the need to position the Tribal sawmill enterprise for the

future, and the need to develop employment opportunities for the growing population of enrolled Tribal members are the primary drivers for specific components included in the Warm Springs Forest Products Industries (WSFPI) 5-Year Strategic Plan. The mandate from the Tribal Council of the Confederated Tribes of Warm Springs, the Tribal Council being the governing body of the Tribes, is profit, employment, training, and education. To meet this mandate, a 5-Year Strategic Plan was developed in 2002/2003 with an implementation date of January 2004. A part of that Plan is the development of a new biomass energy facility. Since mid 2002, we have been actively engaged in securing the raw material base, seeking a purchaser of the power, and exploring financing opportunities. This presentation will share our observations, challenges, and opportunities.

### **Biomass Co-Firing Experience in Utility Pulverized Coal Power Plants**

**Thomas W. Johnson**, Research Engineer, Southern Company, Birmingham, AL; **Bill Zemo**, Alabama Power Company, Plant Gadsden, Gadsden, AL; **Kathy Russell**, Georgia Power Company, Plant Mitchell, Albany, GA; and **Doug Boylan**, Consultant, Birmingham, AL

Southern Company has been engaged in a program to evaluate the technical feasibility, environmental benefits, and economics of co-firing biomass with coal in existing pulverized coal boilers. With increased interest in renewable energy and climate change, lowest cost options of renewable energy generation were sought. In response, several test programs and studies have been conducted by Southern Company into the viability of different co-firing technologies. As part of this program, testing has been conducted in a 70 MW tangentially-fired power boiler at Alabama Power's Plant Gadsden and in a 150 MW unit at Georgia Power's Plant Mitchell. The scope of the test program included investigation of co-firing various types of biomass including sawdust, large wood chips, ground switchgrass, and pelletized switchgrass. Two forms of co-firing were used. Co-milling involves treating the biomass as if it were coal, mixing the material with the coal, and passing it through the coal handling system and coal burners. The other technology is direct injection, in which the biomass is processed to a fine sawdust-like material and blown directly into the furnace through its own dedicated burners. Descriptions of biomass co-firing operations will be presented. Major results will be discussed with particular regard to impacts on pulverized coal boiler fuel handling, feeding, boiler efficiency, emissions, and economics.

### **Overview of a Privately Owned Small-Scale Biomass Co-Generation Project at Cox Interior, Inc.**

**Ruth Logsdon**, Environmental Manager, Cox Interior, Inc. / Cox Waste-to-Energy, Campbellsville, KY

This family run millwork manufacturer has been a leader in biomass co-generation since the early 1990's. Increasing landfill regulations and costs required the company to look in a different direction for its wood waste disposal options. Generating large quantities of wood waste and growing steam demands forced Cox Interior to develop Cox Waste-To-Energy, a biomass co-generation plant. The 5-megawatt plant was sized to accommodate the company's wood waste flow and accept outside sources for revenue, but would also be large enough to support the significant growth Cox Interior has each year. Cox Interior/Cox Waste-To-Energy became the first privately owned power producer to obtain a power contract with a public utility in the state of Kentucky and the plant supplies almost 2 million Kwh to the power grid each year. The main objective of the project is not to sell electricity, but to optimize steam and electricity production to coincide with manufacturing requirements, which has allowed Cox Interior to reap the benefits of biomass co-generation in its steam usage and electric savings. After 13 years of operations, Cox Waste-To-Energy is proving to be an invaluable asset to Cox Interior, Inc.

### **SESSION IIB: Wood Fuel Pellet Opportunities**

#### **Wood Pellets – Research Points to Potential Urban Pellet Materials**

**Philip A. Araman**, Project Leader, USDA Forest Service, Southern Research Station, Blacksburg, VA; and **Robert J. Bush**, Professor, Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, VA

Wood pellets are an efficient form of fuel for industrial, community and home energy needs. The cleanest pellets are made from single

species inputs with little possibility of contaminants. These types of pellets are used in home heating systems. From our research on the pallet recycling industry and landfills in the U.S., we have good data on other potential material sources. The materials are located in and near the major population centers in the U.S. at pallet recyclers and landfills. The conversion of these waste materials to wood pellets has potential in non-home markets and has some potential manufacturing problems and advantages. The potential is to use the pellets in domestic and export manufacturing, electricity, and steam generation facilities. The advantages include low-cost raw materials close to population centers. Another advantage is that drying units may not be needed to manufacture the pellets due to the fact that most of the wood may be between 9-15% moisture content prior to pellet manufacturing. Some disadvantages include possible metal in the wood, mixed species, and contaminants.

### **Export Marketing of Wood Fuel Pellets**

**John F. Colquitt**, President, Fram Renewable Fuels LLC, Savannah, GA

Fram Renewable Fuels LLC is involved in the export of wood fuel pellets to the European wood fuel market. Our company, sponsored by Norwegian shipping interests, is staffed by experienced forestry, wood fuel, logistics, and wood pellet professionals. The presentation will explain the events that have brought us into this business venture and describe the nature of the European fuels market. Though wood pellets have been in use for quite a while, the market for pellets for the purpose of use in large scale power stations in Europe is only about 15 years old. In the last 8 years, there have been 195 pellet mills built throughout the 25 independent states of the EU. In all the states, there are regulations intended to encourage the use of renewable fuels such as pellets. These regulations vary among the 25 EU countries and there continues to be resistance by the energy countries to the full implementation of the Kyoto Protocol. The greatest obstacle to the full development of the European market has ironically been the regulations that have been put into place to bring it into maturity. This has caused reluctance to their entry into long-term agreements. The lack of the political will has not encouraged the establishment of regulations adequate to do the job. We will explore the real pitfalls and anticipated rewards of involvement in the European market and attempt to forecast, or at least guess, where it may be heading.

### **New England Wood Pellet, LLC – A Success Story**

**Steven J. Walker**, President and CEO, New England Wood Pellet, LLC, Jaffrey, NH

New England Wood Pellet, LLC has grown significantly in recent years to its current status as the largest manufacturer of wood pellet fuel in the northeastern U.S. Demand for wood pellets is expected to continue increasing in the years to come. There are many factors driving this demand, not the least of which is the cost of heating with conventional fuels, such as oil and natural gas. New England Wood Pellet is responding with an ambitious expansion plan involving new facilities in three states. In the long-term, we see tremendous potential for wood or other biomass pellet fuel playing an important role in helping America move to a renewable energy economy. Company founder, President, and CEO, Steve Walker will share his 15 years of experience as a leader in the pellet fuels industry.

## **CONCURRENT SESSIONS**

### **SESSION IIIA: Fuels for Schools Case Studies**

#### **Biomass Energy Use at Mount Wachusett Community College – A Case Study**

**Rob Rizzo**, Director of Facilities Administration, Mount Wachusett Community College, Gardner, MA

Mount Wachusett Community College was built in the early 1970's as an all-electric College. By the early 1990's, the College was experiencing utility costs in excess of \$850,000 per year. The College administration recognized the need to address this issue to enable us to provide an affordable education for our students. At the same time, we began to discuss the impacts of utilizing our energy dollars to reduce greenhouse gas emissions, support local economies, and address forest sustainability and viability by demonstrating the use of woody biomass as a source of energy. After a thorough analysis, the College began the task to seek funding to convert the all electric main campus

to a closed-loop hot water heating system. This presentation will describe the tasks required to replicate the College's successful efforts to convert to the utilization of woody biomass as a source of energy. We will discuss district energy options, required finances, developing partnerships, expectations, and projected outcomes to others interested in following our efforts. Potential pitfalls, roadblocks, or problems will also be covered in this talk. In addition, we will highlight numerous energy conservation measures that an organization can implement with paybacks as quick as a few months. Finally, we will deliver an overview of the College's biomass combined heat and power system that we are currently building.

### **The Vermont School Biomass Program – Lessons Learned**

**Paul E. Frederick**, Wood Utilization Specialist, Vermont Department of Forests, Parks & Recreation, Waterbury, VT

Vermont's first wood chip heating system in a school began operating during the 1985-86 heating season. Since that time, 26 additional public and several private Vermont schools have converted their heating systems to utilize wood fuel. Over the years, many lessons have been learned with respect to making a conversion to wood chip heating a successful project. While the choice of equipment is a critical component, informing and educating stakeholders, from project inception to completion and operation, is also crucial. All parties from the facilities maintenance staff, to the administrators, the school board and the general public need to be informed and engaged from the beginning of the planning process. Engineers and architects need to be familiar not only with the heating plant's characteristics, but with the requirements for chip storage and delivery as well. System operators need to become familiar not only with how the equipment functions, but with the characteristics of wood fuel and the nuances of its purchase. Finally, policy makers can play a critical role in the adoption or failure of any idea through the use of financial incentives or regulations. Understanding Vermont's experience with bringing an institutional biomass heating program from a "good idea" to an accepted technology can help other states and regions to avoid some common mistakes and predict some issues they may face.

### **An Overview of the Western States Fuels for Schools Program**

**David C. Atkins**, Fuels for Schools Program Manager, USDA Forest Service, Missoula, MT

The objective of this presentation is to provide an overview of the program in this six-state area for developing small-scale thermal and sometimes CHP projects and the combination of economic and societal benefits that accrue from it. It will review the six operational systems and 11 in development and the lessons learned in the process. It will review the elements of how the program works, savings that can be generated, the funding possibilities, issues with fuel supply, the quality of material, and efficiency of handling and delivery. It will discuss an analysis of the potential market for small-scale woody biomass heating systems. The conclusion of the efforts to date is that small-scale woody biomass thermal and CHP systems are economically viable, a renewable source of energy, and can reduce air pollution and the risk of severe wildfires.

## **SESSION IIIB: Biofuels**

### **Future Opportunities for Biomass Fuels and Power**

**Richard L. Bain**, Group Manager and Principal Researcher, National Renewable Energy Laboratory, Golden, CO

In his 2006 State of the Union address, President Bush established the goal of reducing crude oil imports from the Middle East by 75% by 2025. In support of the goal, the U.S. Department of Energy has established a goal of replacing 30% of today's motor gasoline with biofuels by 2030. This goal will require the commercial production of biofuels at a level of 60 billion gallons of ethanol equivalents. Today, the U.S. production of biofuels is approximately 4 billion gallons of ethanol. This presentation will discuss existing biomass usage and bioenergy technologies; biomass potential as discussed in the "Billion Ton Study;" and products and technologies for the future. Emphasis will be placed on emerging technologies for fuel production: biochemical production of ethanol from lignocellulosic biomass; production of biodiesel and green diesel from fatty acids; thermochemical production of mixed alcohols, Fischer Tropsch liquids, methanol, and dimethyl ether via gasification; production of green gasoline and alkanes from pyrolysis oil; and production of fuels from algae. A discussion of energy efficiency and renewable/fossil energy ratios will be

made. Brief discussions of power production technologies will also be given, concentrating primarily on gasification-based technologies (i.e., gasification – IC engine CHP for small systems and IGCC for large systems).

### **Wood-Based Bio-Oil for Fuel**

**Leonard L. Ingram, Jr.** and **Philip H. Steele**, Professors, Department of Forest Products, Mississippi State University, Starkville, MS

The need for renewable sources of energy has motivated increased research efforts directed toward the development of pyrolysis oil, also called bio-oil, as a liquid fuel and source of useful chemicals. Historically, charcoal has been the primary product from the slow pyrolysis of wood and has been produced and used as fuel for many past centuries. However, in the past 30 years, considerable research has been directed toward fast pyrolysis of woody biomass and the use of the liquid distillate as the product of importance. Mississippi State University has developed a 1 kg/hr laboratory scale auger-fed pyrolyzer. For this study, the pyrolyzer was used to produce bio-oil from pine wood, oak wood, pine bark, and oak bark feedstocks. Fuel characteristics of these bio-oils were investigated by determining water content, acid value, heat value, and other chemical and physical properties. The bio-oil produced in these experiments was similar in character and chemical makeup to bio-oil described in recent literature for other types of fast-pyrolyzer systems. Our bio-oil property comparisons will be useful in selecting feedstocks and developing new systems for refining crude bio-oil.

### **The Forest Biorefinery**

**Harry T. Cullinan**, Professor and Director, Alabama Center for Paper & Bioresource Engineering, Auburn University, Auburn, AL

A major platform of the American Forest & Paper Association's Agenda 2020 Technology Alliance is focused on the Forest Biorefinery. This platform is the basis for enabling existing kraft pulp mills to significantly improve their competitive position by producing new value streams in addition to chemical pulp from the woody biomass raw material as well as agricultural crops and residues. The major features of the forest biorefinery concept consist of fuel and chemical production from both material extracted prior to pulp production as well as the spent pulping liquor. In the basic configuration, hemicelluloses are extracted from the wood chips in advance of the digester and the sugars are converted to ethanol. The spent and concentrated black liquor is converted in a gasifier to syngas while the spent cooking chemicals are separated and converted for re-use. The syngas is cleaned and either converted catalytically to liquid fuels or fired directly to a gas turbine and a heat recovery steam generation system for power production and process steam. A preliminary business case shows the potential for a two-to three-fold increase in profitability for an average sized kraft mill.

### **Biodiesel Developments in Georgia**

**Thomas T. Adams**, Director, Faculty of Engineering Outreach Service, and **Dan Geller**, Research Engineer, and **John Goodrum**, Professor, Faculty of Engineering, University of Georgia, Athens, GA

The supply of low-cost feedstock to make biodiesel is the preeminent issue in developing the biodiesel industry in Georgia. Chicken fat is currently successfully used in the sole commercial plant in the state. Free fatty acid content and cloud point are the main criteria that are used in evaluating feedstock. For Georgia, canola, soy and peanut oils are being considered for use. Membrane processes are being considered for free fatty acid extraction and upgraded bio-oil from wood pyrolysate is being researched for use as a petroleum diesel replacement.

### **Ethanol Production from Agricultural Residues and Forest Products**

**Joy Doran Peterson**, Assistant Professor, Department of Microbiology, University of Georgia, Athens, GA

Environmental concerns and unease with our dependence on foreign oil have renewed interest in converting biomass into fuel ethanol. Current ethanol production is mainly corn-based fermentations using yeast; however, the volume of plant matter available makes lignocellulose conversion to ethanol desirable. No one organism has been shown to break bonds in lignocellulose and efficiently metabolize resulting sugars into one product, however, the National Renewable Energy Laboratory, the laboratory of Dr. Lonnie Ingram at the University of Florida, and Dr. Nancy Ho at Purdue University (and others) have fine tuned engineered ethanologens over the last two decades. In addition, we are using the environment (processing plant sites, insect gut, fer-

menting wastes, paper mill sludge lagoons, etc.) as a source of novel microorganisms and enzymes and are in the process of evaluating these microbes and enzymes for conversion of pine, sugar beets, paper sludge, and other biomass into ethanol. Enzymatic conversion of lignocellulose generates minimal degradation products, but is currently the slowest and most costly method of conversion. Chemical and physical pretreatments also may be employed to break carbohydrate bonds, resulting in differing product profiles. Combining chemical, physical, and enzymatic pretreatments for reduction of biomass to fermentable sugars will be discussed. Adding enzymatic capabilities to existing biocatalysts decreases the commercial enzymes required to reduce plant matter into fermentable sugars. An overview of pretreatments, selected ethanologens, and recent improvements will be discussed with an emphasis on applications for forest product conversion to ethanol.

## **WEDNESDAY MORNING, MAY 17**

### **CONCURRENT SESSIONS**

#### **SESSION IVA: Woody Biomass Grant (Panel Discussion)**

##### **Coordinated Resource Offering Protocol (CROP)**

**Scott L. Avcock**, Program Administrator, Central Oregon Intergovernmental Council, Redmond, OR

The goals for the Coordinated Resource Offering Protocol (CROP) project are to: 1) Develop public and private land management capacity and commitment to engage in consistent, coordinated planning for fuel treatment by-product supply, based on longer-term resource planning and across multiple jurisdictions; 2) Create and maintain a steady, predictable flow of small-diameter material within individual "community supply landscapes"; 3) Use the coordinated small-diameter timber supply offerings to catalyze private investment in by-product-utilizing manufacturing capability; and 4) Use the resulting market for small-diameter materials to enable the expansion of fuel reduction and ecosystem restoration project acres. One of the key benefits of CROP is that it reduces a significant area of risk and uncertainty – a stable supply of material – for businesses that want to produce marketable forest products and energy products from small-diameter trees and woody biomass. At the same time, the model avoids exposing public land agencies to onerous, difficult-to-service, long-term contractual obligations for supply delivery (while still allowing the pursuit of long-term contracts where they are appropriate). The presentation will discuss the background to and early implementation of the CROP on the Deschutes-Ochoco and Mt. Hood National Forests, and the Prineville District BLM lands in Central Oregon. It will also discuss some of the stakeholder collaboration efforts that formed the basis for adoption of CROP, as well as some of the challenges encountered in early implementation.

##### **Project to Enhance the Utilization of Woody Biomass from the National Forest in South Carolina**

**Joseph J. James**, President and CEO, Corporation for Economic Opportunity, Columbia, SC

For a 2-year period, the Corporation for Economic Opportunity will bring together a group of South Carolina partners, who will work to increase the use of woody biomass from National Forest lands. This project will consist of the collection and utilization of woody biomass from the Francis Marion National Forest, as fuel for the Santee Cooper electric utility, and from the Sumter National Forest, as fuel to make steam and electricity for the University of South Carolina. Other customers will be accommodated, as appropriate. Approximately \$200,000 in incentives will be used to encourage customers to make investments that will allow them to use woody biomass from these two parts of the National Forest. This project will complement the National Forest's hazardous fuels treatment efforts and will expand existing and create new markets for National Forest biomass. As markets and demand increases, prices will also rise. As a result of Hurricane Hugo in 1989, approximately 30,000 acres of Francis Marion (FM) National Forest land is currently in a condition needing treatment within the next few years (less than 10 years). In order to accomplish the task of treating that acreage, the regular district timber sale program is expected to treat 20,000 of the 30,000 acres by offering standard commercial "first-thinning" timber sales (typically stand ages are 16-25 years old). Simultaneously, the FM Biomass

Stewardship Project will thin the remaining 10,000 acres by targeting treatment of stands populated with loblolly pine trees 2-9 inches diameter at breast height, 25-60 feet in height, and densities ranging between 600 to over 2,000 trees per acre. To date, NEPA documentation has been accomplished on the first 990 acres of the FM Biomass Removal Project. The contract specifications and bid packages will soon be completed for the FM Macedonia Biomass Removal Contract. It will be an Integrated Resource Service Contract and will be advertised during the last 2 weeks of May 2006. Approximate acreage to be treated is 1200 and the approximate volume of biomass is 50,000 tons of chips. The two Sumter National Forest piedmont units are called the Enoree Ranger District and the Long Cane Ranger District. Both districts have many thousands of acres in need of silvicultural treatments. Currently, most of the stands in need of treatment are overstocked and in need of thinning and prescribed burning in order to reduce the hazard of southern pine beetle infestations and catastrophic fire events. A large backlog of first thinnings has developed on both of the piedmont districts. For the Long Cane RD, very poor market conditions have existed in the western part of South Carolina and into eastern Georgia for the last 10 years or more. During those years, sales containing large to moderate amounts of pulpwood have either had utilization problems or have received no bids. High haul costs made the product uneconomical to harvest. A new market source (especially for small pulpwood) would be a huge boost to the owners of timberlands in and around that part of the state. To date, NEPA documentation will be completed on several thousand acres over the next year, which means both districts, will be increasing the number of acres treated annually significantly in the near future. First thinnings and treatment of young stands will have a high priority for the next several years, so development of new markets for Sumter NF biomass would be a timely occurrence.

### **Purchase of Low Impact, Economical Biomass Harvesting Equipment for White Mountain Stewardship Project**

**Dwayne D. Walker**, Vice President, Operations, W.B. Contracting, Inc., Eagar, AZ

Lessons learned by the communities of The White Mountains from the 2002 Rodeo/Chediski Fires that consumed 468,000 acres and 400 homes will be discussed. The following will be included: the change in attitudes about thinning, the importance of the Healthy Forest Restoration Act, the cooperative efforts of environmental organizations, the White Mountain Stewardship contract, and various thinning and harvesting techniques. The Woody Biomass Utilization Grant provided to W.B. Contracting, Inc a whole-log forwarder that will allow access for thinning in previously inaccessible areas. Without this equipment, there are approximately 4,000 acres that cannot be included in the Stewardship contract, due to inaccessibility. The impact that advanced equipment has on the environment compared to traditional methods of thinning will be included. There will be a focus on current market trends and the general "buzz" of future endeavors in the utilization of small-diameter trees, such as wood heating pellets, moulding, mulch, animal bedding, specialty wood products, and building materials.

### **Reducing Hazardous Fuel Treatment Costs by Lowering Workers' Compensation Insurance Rates**

**Laura F. McCarthy**, Western Fire & Forest Restoration Program Director, The Nature Conservancy, Santa Fe, NM

Workers' compensation insurance rates in New Mexico account for nearly half of the labor costs for forest restoration. New Mexico rates are the highest of any western state and as a result, more than 40% of FY05 fuel treatment contracts were awarded to out-of-state contractors. Other states have had equally high rates at some point in the past, including Colorado, Maine, and Minnesota, and have been very successful in bringing their rates down through a combination of safety training, legislative action, and activities of a forest products association. The presentation will focus on the lessons learned from other states, the strategies developed and implemented in New Mexico, and the progress achieved to date. The workers' compensation rates in New Mexico are already 50% lower than they were at the start of the program, translating into a significant per-acre cost reduction for fuel reduction treatments.

### **Evaluation and Monitoring Protocol for Woody Biomass Grants Program**

**Edward M. (Ted) Bilek**, Economist, USDA Forest Service, Forest Products Laboratory, Madison, WI

This paper reports on the Woody Biomass Utilization Grants Program that is administered by the Technology Marketing Unit of the USDA Forest Service. The program, begun 2 years ago, has allocated over US\$8 million in grants to firms and organizations to help ameliorate hazardous fuels issues in the nation's forests. The goals of the program are: 1) To help reduce management costs by increasing value of biomass and other forest products generated by hazardous fuel treatments; 2) To create incentives and/or reduce risk for increased use of biomass from National Forest lands (must include National Forest System lands; however, may also include other lands such as, Bureau of Land Management, Tribal, State, local, and private); 3) To institute projects that target and help remove economic and market barriers to using small-diameter trees and woody biomass. The evaluation and monitoring program addresses the question: "Can federal government investment in the state and private sector lower the cost per acre that the Forest Service incurs for hazardous fuel reduction treatments on National Forest lands? And if so, can this reduction be sustained over the long term?" The techniques used for the evaluation are presented along with preliminary results from the first round of monitoring. Limitations and concerns regarding the evaluation process are discussed along with suggestions for improvement.

### **SESSION IVB: Handling Hurricane Debris**

#### **Utilization of Timber Damaged by Hurricane Rita and Related Forest Recovery Efforts**

**Burl Carraway**, Assistant Department Head, Sustainable Forestry & Economic Development, Texas Forest Service, College Station, TX

Hurricane Rita made landfall on September 24, 2005, around 2:30 am CDT on the southwest coast of Louisiana. On September 26, the Texas Forest Service began to implement the Timber Damage Assessment Plan it had designed a week earlier in cooperation with the Southern Research Station (SRS) of the USDA Forest Service. Two Texas Forest Service foresters conducted an aerial survey on September 26-27. Eight Texas Forest Service Forest Inventory and Analysis (FIA) field crews and two SRS FIA crews collected ground-truthing data on 222 points on September 28-29. Total volume of timber damaged and affected was estimated on September 30 to be 967 million cubic feet, for a total stumpage value of \$833 million. Total damaged and affected acres were 771,000. A Hurricane Rita Forest Recovery Task Force was established on October 5. Potential implications of hurricane damage include impact on economic development, future fire hazard, insects and disease, and water quality. Forest recovery challenges included economics of timber salvage, logging capacity, landowner assistance and interest, timber prices, markets, and reforestation, site preparation, and seedling supply. The damaged timber volume could have been used to make forest products worth \$3.7 billion. Such level of forest industry economic activity could have supported total economic activity in east Texas of \$13.2 billion. A mill survey and field data collection are currently being conducted by the Texas Forest Service to determine the total amount of timber salvaged.

#### **Utilizing Timber Damaged by Two Hurricanes and Related Recovery Efforts**

**Cornelis F. de Hoop**, Associate Professor, School of Renewable Natural Resources, Louisiana State University AgCenter, Baton Rouge, LA

Because of the attention cast on New Orleans in the wake of Hurricane Katrina, the damage to the timbered areas of Louisiana went largely ignored by the media. Commercial timber losses are estimated to be in excess of 50% in three of the parishes. Estimated losses in Louisiana alone are 3 billion board feet (on 1 million acres) from Hurricane Katrina and 1.7 billion board feet from Hurricane Rita. Many forest logistical problems had to be addressed. Six days after Katrina struck, a Hurricane Forest Recovery task force met with 60 people attending from industry, state, federal, ngo and academic backgrounds. Issues addressed included truck weight limits, mill log inventories, preliminary damage assessments, fuel supplies, lodging for non-resident loggers and others, timber salvage priorities, products and markets from salvage, transporting logs in bulk out of the area, establishment of new log storage facilities, and safety concerns. Six committees were established to address the issues and a communication network was established to share information. Salvage on non-indus-

trial private landholdings became an increasing concern with time, because most timber companies were necessarily committed to salvaging their own assets first. New markets were extremely difficult to establish. The pursuing drought throughout the winter has made wild-fire suppression a major priority, but is hampered by the decreased state revenues from the loss of much of the economy of New Orleans and the practically complete devastation of three coastal parishes.

### **Utilizing Timber Damaged by Hurricane Katrina and Related Forestry Recovery**

**Jimmy Mordica**, Deputy State Forester and Director, Conservation Education & Public Outreach, Mississippi Forestry Commission, Jackson, MS

The Mississippi Forestry Commission, Mississippi Department of Environmental Quality, Mississippi Department of Agriculture & Commerce, and the U.S. EPA Region 4, collaboratively organized a Biomass Summit involving multiple state and federal organizations. The purpose of this summit was to identify options for: 1) expeditiously removing the unprecedented amount of biomass left on the ground as a result of Hurricane Katrina, and 2) exploring future bio-based economic opportunities within the State of Mississippi. The presentation is a brief summary of the possible actions that were identified.

## **CONCURRENT SESSIONS**

### **SESSION VA: Smallwood Harvesting Panel – Breaking New Ground**

#### **Improving Recovery of Residues from Conventional Logging Operations**

**Frank W. Corley**, President, Corley Land Services, Chapman, AL  
Forest debris in intensely managed pine is a high-volume source of biomass. Fifteen to 20 tons per acre are left on most sites. Collecting this debris provides the opportunity to improve growth rates, reduce cost, and produce biomass for energy production. The application of pre-harvest herbicides on final harvest sites is a key element in a proposed new system to harvest, reforest, and collect biomass for fuel. If herbicides are not applied pre-harvest many of the gains made by removing the debris are lost. Sour felling (transpirational drying) is proposed to improve fuel value. In combination with whole tree chipping for fuel, this process increases the value of thinning. This approach also produces very high-value biomass and improves the output of conventional boiler systems.

#### **Exploring Scandinavian Smallwood Harvesting Equipment**

**Rob Rizzo**, Director of Facilities Administration, Mount Wachusett Community College, Gardner, MA

The U.S. utilizes only a small fraction of our available woody biomass as an energy source. Recent trends across the globe show dramatic increases of biomass utilization. As part of an ongoing project to explore differing approaches, policies, and mechanisms employed throughout the world, Rob Rizzo spent 10 days last September touring Finland to observe the biomass industry firsthand. Much of the time was spent studying the well established district heating systems utilized by entire communities and the infrastructure that has been developed to harvest, process, and transport woody biomass from the stump to the energy plant. The presentation will focus on biomass utilization in Finland including policies, partnerships, and an array of harvesting, processing, and transporting machinery employed to make biomass a major contributor to the energy needs of this Scandinavian country. We will also discuss the tools, policies, and programs needed to import some of the lessons learned to the U.S.

#### **Case Study of a Biomass Harvesting Operation on National Forest Lands**

**Dana Mitchell**, Research Engineer, USDA Forest Service, Southern Research Station, Auburn, AL

A case study for hog fuel production was conducted on the Talladega National Forest, Oakmulgee Ranger District, Alabama, during the winter of 2006. District personnel had determined that forest health was declining due to two indicators: 1) a decline in red-cockaded woodpeckers, and 2) an increase in southern pine beetle infestations. Traditional timber sale contracts were not applicable because of the depressed local pulpwood market and the high number of stems in the identified stands that were below merchantable standards. A chipping

operation for producing fuel (hog) chips was installed on three stands. Two stands were loblolly pine (28- and 37-years-old) and the third stand was a 36-year-old longleaf pine stand. Biomass was the only product to be removed and was identified as all stems less than 7-1/2 inches dbh and all sweetgum, regardless of dbh. Data collection included a detailed time study of the chipper and loader with general production rates for the feller-buncher and skidder. Findings were compared to costs of cut-and-leave service contracts. In addition, this pilot project compared a new biomass volume estimating program (developed by the USDA Forest Service in Region 8) to the actual volume removed.

### **SESSION VB: Utilization Opportunities Created by Invasive Species**

#### **Utilization Options to Control *Ailanthus* (Tree-of-Heaven)**

**Charles W. Becker III**, Utilization & Marketing Manager, Virginia Department of Forestry, Charlottesville, VA

*Ailanthus altissima* or tree-of-heaven, a native of China, was first introduced to the United States from England to Philadelphia, Pennsylvania in 1784. Widely planted in cities during the 1800's, it has become naturalized in 42 states. It has become a problem, due to its tolerance of poor soils, low soil moisture and air pollution, and its prolific regeneration from root sprouting and heavy seed production. *Ailanthus* is considered one of the top woody invasives in Virginia. Based on current FIA inventory data, over 35 counties in Virginia have measurable quantities of *Ailanthus* and state-wide volumes are over 48 million cubic feet, concentrated primarily along the base of the Blue Ridge Mountains. This volume amount exceeds that of many native tree species and *Ailanthus* is 46th in abundance out of a list of 104 tree species for Virginia. Since most of the forest land in Virginia is privately owned, controlling *Ailanthus* is difficult due to the cost of educating the public and standard control measures. Using market development as a means of mitigating impacts of invasive tree species is a novel approach that holds promise for addressing multiple problems. Several *Ailanthus* trees were harvested and converted into lumber, dry-killed, and made available for presentations and to woodworkers to determine if any demand could be generated. Research on drying, physical characteristics of the wood, and historic and local uses of *Ailanthus* is ongoing. Research on combining harvest with mechanical and chemical control methods is in process. The initial response of those who have seen the lumber has been positive.

#### **Urban Wood Utilization and the Emerald Ash Borer: Increasing the Viability of Wood-Based Industry in Southeast Michigan**

**Anthony K. Weatherspoon**, Forest Products Specialist, Michigan Department of Natural Resources, Lansing, MI; and **Jessica M. Simons**, Natural Resources Specialist, Southeast Michigan Resource Conservation & Development Council, Ann Arbor, MI

Awareness of wood waste issues has become even more pressing in the Great Lakes region with the outbreak of the emerald ash borer. This insect has killed an estimated 15 million trees in Michigan, making the need for higher value recycling options even more pressing. Although much of the ash has been removed already in communities, millions of trees remain standing and represent a large burden for removal and disposal. A partnership of the Michigan Department of Natural Resources, the Southeast Michigan Resource Conservation & Development Council, the USDA Forest Service Wood Education & Resource Center, and the USDA Forest Service Rural Development through Forestry Program recognized this need and created the *Ash Utilization Options Project* to assist communities and businesses in finding value-added uses for all of the removed urban trees throughout the region. Through the demonstrations, training workshops, research projects, and outreach efforts that have taken place since 2004, this collaborative group has successfully exhibited how urban wood utilization strategies that foster cooperation between local governments and industry can have multiple benefits for a region struggling with both the emerald ash borer infestation and other loss of economic opportunities. The projects completed to date show remarkable promise in the following areas: 1) reducing the cost of invasive species eradication programs, 2) lowering wood disposal costs for communities, 3) increasing consumer demand for locally-produced wood products, and 4) stimulating the local wood industry by creating new jobs and new market opportunities.

## Use of Salt Cedar and Other Invasive Species in Wood-Plastic Composites

**Craig M. Clemons**, Materials Research Engineer, USDA Forest Service, Forest Products Laboratory, Madison, WI

As invasive trees such as salt cedar and others become more prevalent, a host of environmental and ecological problems have also occurred and finding an outlet for these materials would be beneficial. Wood-plastic composites may provide one such outlet. Recent growth of wood-plastic composites has been great, mostly due to its rapid growth in exterior building products such as railings, window and door profiles, and especially decking. A number of factors must be evaluated when considering wood-plastic composites as an outlet for invasive species. For example, compositional differences between invasive species and those more commonly used in wood-plastic composites can be significant and these differences can affect processing and performance. Issues and opportunities for using invasive species in wood-plastic composites will be discussed as well as recent research undertaken on salt cedar and other invasives at the USDA Forest Service, Forest Products Laboratory.

**WEDNESDAY AFTERNOON, MAY 17**

## CONCURRENT SESSIONS

### SESSION VIA: Successful Businesses

#### Turning a Good Idea Into Reality, One Glitch at a Time

**Peter Stark**, Founding Partner and Head of Marketing, North Slope Sustainable Wood, LLC, Missoula, MT

This presentation will briefly tell how North Slope Sustainable Wood, LLC, was founded and how it has thrived, where it has gone right ... and where it has gone wrong. The firm manufactures high-quality tongue-and-groove flooring from small-diameter larch trees harvested from forest restoration sites in the Northern Rockies. The idea was born in 2003 when founding partner Peter Stark was trying to find a use for the small-diameter trees thinned from 80 acres of overgrown forest he owns on the wildlife-urban interface outside Missoula, Montana. At the same time, he and his wife, a professional modern dancer, were building a dance studio in their backyard. Stark experimented with using the culled small-diameter larch trees for the dance floor. The result was so successful it led to the founding of a business. Since the firm's founding in 2004, Stark and his partners, restoration forester Matt Arno and environmental lawyer Mike Wood, have had to stumble their way through the proverbial wilderness faced by any start-up business, but in this case a wilderness made all the more confusing by the fact that the concerted effort to commercially use small-diameter trees and the "green" or "sustainable" building industry are both just developing. No one is quite sure where they are headed. Stark's presentation will focus on: 1) the need to stay vigilant for opportunity; 2) the need to be flexible and willing to improvise; and 3) the importance of marketing and emphasizing a good "story" in creating a successful business using small-diameter trees.

#### Implications of Real-World Examples of Woody Biomass Use

**Stephen P. Gaty**, Senior Analyst, Natural Resources & Environment Team, U.S. Government Accountability Office, Denver, CO

Previous work by the U.S. Government Accountability Office (GAO) and others has identified numerous obstacles to woody biomass use, including the high cost of harvesting and transporting the material and the uncertain supply of it in some areas. Nevertheless, businesses and other entities in a variety of industries are currently using woody biomass for a range of applications, including wood products, building heat, and electricity generation. In 2005, at the request of the House Committee on Resources, GAO reviewed 13 woody biomass users across the country to learn more about their use of the material. The presentation will briefly cover: 1) factors that facilitated woody biomass use among these users; 2) challenges that these users faced; and 3) the insights that our findings may offer for promoting greater use of woody biomass.

## Industrial Applications for Biomass

**Jim Higgins**, Market Consultant, Advanced Recycling Equipment Inc., St. Mary's, PA

One of the oldest and most widely used applications for biomass is as a heat source for industrial applications. From dry kiln operations at numerous sawmills throughout the country, to the growing demands of an increasingly energy sensitive greenhouse industry, biomass is fast becoming the fuel of choice for industry. If an industry has a need for steam, hot water, or forced air in their industrial process, a new generation of biomass burning systems are providing consistent, cost-effective alternatives to traditional fossil fuel sources. The presentation will focus on several companies now using or considering biomass as an alternative to traditional fossil fuels.

### Adjusting to a Small-Log Economy

**William S. Turner**, Timber Procurement Manager, Timber Products Company, Yreka, CA

Due to various circumstances such as the Northern Spotted Owl and the California state government encouraging renewable energy sources, a small-log infrastructure was built in California and Southern Oregon in the 1990's that could efficiently use small logs for both wood products and energy. Many existing mills went through retrofits to be able to more efficiently handle small logs. Other mills that could not afford to retool to this new economy simply went out of business. Others retooled and then after struggling to find enough logs to keep operating, gave up and closed for good. On the biomass energy side of the equation there were over 63 biomass plants in California of 3 megawatts or larger in the early 1990's. Unfortunately, only 28 are currently operating, and of those only 13 use biomass generated from forest fuels. In Oregon, the biomass industry was not encouraged by the state government to the same extent as it was in California. Therefore, to utilize small logs at a lower initial cost, several pole and post mills have been established. There is current infrastructure existing to handle small logs in Northern California and Southern Oregon and it has underutilized capacity. Existing infrastructure is being lost not because the logs are too small, but because too few are actually getting to the marketplace in a cost-effective manner. Eighty to 90% of the small logs being processed today are coming from private lands.

### SESSION VIB: Marketing Strategies for Products from Small-Diameter Timber

#### Niche Marketing Strategies for Products from Small-Diameter Timber – Using Natural Lump Charcoal as a Case Study

**A.L. (Tom) Hammett**, Professor, Department of Wood Science & Forest Products, **Phil Radtke**, Associate Professor, Department of Forestry, and **Robert L. Smith**, Professor and Extension Specialist, Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, VA

In larger (commodity) markets most customers have similar needs and products are generic. Finding markets for small volumes of small-diameter products is difficult and often requires a special focus or strategy. "Niche" marketing may help you add value to these products. These special, unique, one of a kind markets require marketing and management skills. We use charcoal made from small hardwood pieces left over from logging in Southwest Virginia as case study to explore the possibilities. Identifying customers and devising product and promotional strategies for natural chunk charcoal will serve as examples for other products from small-diameter timber.

#### Internet Marketing of Wood Products

**Timothy P. Holmes**, Research Director, Holmes & Associates, Saranac Lake, NY

It is sometimes difficult to shift gears to marketing and sales over the Internet. Online you may have only a few paragraphs and a few pictures to sell your wood products to someone that you may never meet or even talk to. To add to the challenge, you have to make your sales points quickly and effectively because you have less than 3 minutes of their time. Based on five years of e-Commerce experience – and a steady growth in sales – Tim Holmes will provide specific information on fine tuning your web presence, increasing your visibility, and improving your success with online sales. Session participants will gain a greater understanding of the following: 1) e-Commerce Reality Check – how much will you sell. 2) Converting Shoppers to Customers – why online shoppers choose one product over another. 3)

Finding a Needle in a Haystack – how to tailor your product descriptions for improved visibility in Google and other search engines. 4) A Picture is Better than 1,000 words – making the best use of product photos. 5) Choosing an Online Sales Outlet – your own website, online catalogues, gallery sites, regional directories, etc. Your company has to have a website otherwise you do not exist for a large pool of potential customers. While it may not replace your other marketing and sales outlets, an effective website can and should contribute to your bottom line.

### **Branding and Marketing: Lessons from the Ford Foundation Community-Based Forestry Demonstration Program 2000-2005**

**Mary Virtue**, Owner, Cornerstone Consultants, West Chester, PA

Marketing was one of the bigger challenges for the participants in the Demonstration Program. Every aspect of marketing – from product selection and development to strategies that will reach the customer – raised difficulties. Even successes seemed to lead swiftly to the next challenge. By working through many of the challenges we faced, we learned something about how to begin to address them. Four key lessons we will explore in this session are: 1) Value-adding is the best way to work effectively at a smaller scale, because unprocessed commodities necessarily reflect prices on global markets. 2) Communities may localize and regionalize their target markets, especially for high-end products, but global markets will still affect them. 3) Multi-product and multi-market economic and marketing strategies offer a higher likelihood of achieving economic vitality and supporting increased forest restoration. 4) To build a sustainable forest-based economy, it is necessary to coordinate all of the pieces of the entrepreneurial puzzle – resource flow, product development, production capacity, and effective marketing. Often, a community-based organization can be well-positioned to play this coordinating role. Lessons related to marketing, asset management, small business networks, production and funding will also be discussed.

## **CONCURRENT SESSIONS**

### **SESSION VIIA: Roundwood**

#### **The Evolution and Future of Roundwood**

**Karen Kovatch**, Co-Owner, Roundwood West Corporation, and Executive Administrator, Intermountain Roundwood Association, Seeley Lake, MT

For almost 20 years, the Intermountain Roundwood Association (IRA) has represented the small-diameter roundwood industry. The IRA was formed in the late 1980's by post and pole manufacturers as well as wood preservers in an effort to present a united front to government agencies. One of the first issues the Association tackled was the lack of available supply of raw material from Federal lands. Today, the consistent and stable supply of raw wood is still one of the biggest concerns to roundwood producers. The definition of small-diameter trees evolved from unmerchantable slash to a merchantable wood product called roundwood. We will look back at the accomplishments of the roundwood industry during this time. How we gained recognition with both the USDA Forest Service as legitimate timber producers with a viable interest in forest management policies and by the U.S. Environmental Protection Agency as an organization endeavoring to help develop, comply, and cooperate with government mandates. The presentation will discuss co-sponsoring training sessions for recertification of pesticide applicator licenses for wood treatment and creating a spirit of cooperation and friendship among roundwood producers which has been positive for our industry. The presentation will explain the Quality Awareness Campaign which promotes roundwood products and the creation of an independent website to promote the Association and each of our members. The future of roundwood products depends on a constant and stable supply of small-diameter trees at a competitive price. The perceived amounts of thinning residue are not reaching long-time producers who have good markets established.

#### **The Evolution of Roundwood Machinery**

**Edwin P. Smith**, Sales Manager, Round Wood Systems, Helena, MT

Round Wood Systems develops and manufactures production machinery utilizing small-diameter logs for use in the post, pole, and rail industry. The presentation will discuss the evolution of post and pole machinery up to and including the Round Wood Systems dowel mill. Also presented will be the differences and characteristics of pealed and

doweled round wood product as well as their uses. Further topics of discussion will include the uses for production support machinery, mechanization, and computerization of round wood machinery.

### **Cable Suspension Trail Bridge Using Small-Diameter Roundwood**

**Bradley D. Miller**, Senior Bridge Project Manager, HDR One Company, Missoula, MT

The 1990 cable suspension trail bridge near Missoula, Montana, is unique in that it uses small-diameter bug killed lodgepole pine. The USDA Forest Service provided the smallwood material and grant money to promote its use. It uses 6" round members for floorbeams, braces, and 6" half rounds for its lattice stiffening trusses. The timber members were treated after fabrication with copper quinolinolate, a colorless, odorless treatment. The structural connections were made using steel shear plates. The bridge was detailed to make it very easy to replace members if that becomes necessary in the future. A unique feature is the federally-funded experimental decking made from plastic / wood sawdust / bark / needles. This was the first use of this special 4" x 12" member extruded with rectangular voids, developed for possible use in U.S. Navy docks. It was installed longitudinally in lieu of timber glued-laminated panels. The bridge uses rubber mats from recycled tires for a non-slip wearing surface for pedestrians and horses. The bridge was designed by HDR Engineering, Inc. for Friends of Missoula Parks, a non-profit organization. After completion, it became part of the trail system for the City of Missoula, Montana.

## **SESSION VIIB: Emerging Markets**

### **Is Mulch a Market? Current Issues**

**Steve G. Jarahian**, President, Mulch & Soil Council, General Manager, Fafard, Inc., and Regional Sales Manager, Conrad Fafard, Inc., Anderson, SC

The horticultural mulch industry has been an active market for the Forest Products Industry for decades. Beginning as an alternative disposal solution in response to the 1972 Clean Air Act prohibiting burning, mulch grew into a significant revenue resource in the early 1980s and 1990s. Like all markets, economic and environmental forces create change. New issues have recently been added that now impact the mulch and soil market. Consumer fear of product contaminants, insect infestations, and molds and fungi require producer assurances of a clean product and add to the manufacturer's liability costs. Landscapers and other large users have also increased their demand for proof-of-product safety. Industry standards and Mulch & Soil Council Product Certification are the main resources to address consumer concerns and expand the market. In recent years, the number of state and Federal agricultural quarantines for insect and disease problems have grown. Quarantines increase the requirements for maintaining company compliance and the liability of producers for quarantine violations. Last, but not least, competition from wood recycling must be considered. The recycling industry is a source of significant volumes of lower-cost products made from post consumer and industrial mixed waste. Consideration must be given to the local market impact of alternative mulch supplies before initiating or expanding mill operations to serve the same market.

### **Various Residential Opportunities for Wood-Plastic Composites**

**Vikram Yadama**, Assistant Research Professor and Extension Specialist, Wood Materials & Engineering Laboratory, Washington State University, Pullman, WA

Growing environmental concerns, increase in intensively managed plantations, need for utilization of low-value thinnings from hazardous fuel reduction, demand for more value-added products from highly variable fiber resources, and voluntary EPA ban on use of CCA-treated lumber for residential applications have been some of the driving forces for growing interest in wood-plastic composites (WPCs). While cogeneration can help dispose of this low-value biomass, value-added opportunities exist in the production of engineered wood-based composites, such as WPCs. WPCs, a rapidly developing technology, provide a chemical free and environmentally benign choice of more durable material for exterior applications in building construction. Over the last 5 years, WPCs have gained over 200% of residential construction market share reaching almost a \$1 billion in annual sales. WPC demand is expected to grow by over 20% over the next 5 years. Residential decking and railing (over a \$3 billion market) has captured nearly two-thirds of the WPC market. Pressure-treated lumber that

represents nearly 70% of the decking materials has been losing market share, while WPCs have been gaining rapidly (15% in 2004). Besides decking and railing, a demand exists for strong, cost-effective, durable, and environmentally benign building material for exterior applications, where performance is given more importance than price. The presentation will focus on materials needed to manufacture WPCs, the manufacturing process, pros and cons of WPCs, and applications of wood-plastic composites for residential use.

### **TimTek – A New Engineered Product Made from Small-Diameter Trees**

**R. Daniel Seale**, Professor, **Terry Sellers, Jr.**, Emeritus Professor, **H. Michael Barnes**, Professor, **Sheldon Q. Shi**, Assistant Professor, **John Black**, Research Associate III, and **Jason Leng**, Research Associate III, Department of Forest Products, Mississippi State University, Starkville, MS

Globalization in the paper industry has left millions of acres of southern pine plantation thinnings without markets. The lack of markets and resultant low product prices has provided the impetus for individuals and governments to seek marketing opportunities. The TimTek process was originally conceived in Australia as Scrimber and provided potential to develop a new product and market opportunity. The technology was imported and attempts were made to demonstrate the technology on southern yellow pine plantation thinnings. Initial attempts failed to produce high-quality products. However, after modifications to almost all of the processing machinery and development of an alternative pressing methodology for pressing phenol-formaldehyde resins in a steam chamber, significant improvements in product quality in terms of modulus of elasticity and modulus of rupture have been demonstrated. One company has announced plans to construct a facility to produce the product and work continues at Mississippi State University to support the commercialization effort of this company. Other companies have shown interest in the technology and have begun initial tests with other species.

## **POSTER PRESENTATIONS**

### **Wood-Plastic Composites Reinforced with Fibers from Small-Diameter Southern Pine Trees**

**Qingzheng Cheng**, Graduate Research Assistant, **Suzhou Yin**, Visiting Scientist, **Siqun Wang**, Assistant Professor, and **Timothy G. Rials**, Professor, Tennessee Forest Products Center, and **Kevin M. Kit**, Associate Professor, and **Marion Hansen**, Professor, Department of Materials Science & Engineering, University of Tennessee, Knoxville TN

Material systems that can take advantage of the unique characteristics of small-diameter timber are of considerable interest. Besides simply allowing more efficient utilization of the resource, value-added markets would improve the economics of silvicultural treatments needed to improve ecosystem health and quality. One promising option is wood-plastic composites, which is one of the more rapidly expanding sectors of the forest products industry. This study considers an alternative approach to both generate the fiber reinforcing component and produce the composite products. Wood chips were generated from small-diameter southern pine trees that were killed by southern pine beetle. The wood chips were steam-exploded (SE) to yield a fibrous mass that was subsequently mixed with polypropylene (PP) fibers by two different processes. The first approach was a dry process that included blending, compounding, and compression molding. A wet process was also adapted from a standard paper handsheet method followed by compression molding to consolidate the mixture material into panels. Mechanical tests revealed that composite stiffness (modulus of elasticity, MOE) was improved by SE pine flour, but the strength (modulus of rupture, MOR) decreased appreciably without addition of a coupling agent. The introduction of a coupling agent increased the strength of PP composites to levels approximating neat polymer. Thermal analysis of the material provided some insight into the structure of composites, and suggested that SE dead pine flour interacts with PP to change its structure. The wood-plastic composite made by the wet process had slightly higher flexural properties than one by dry blending method, but lower than one by compounding method. The material variables that affect product properties will be considered in the poster presentation.

### **Biomass Collection and Handling from Wildland-Urban Intermix Projects on Residential and Suburban Properties**

**Mark S. DeTray**, **David N. Lanning**, **James L. Fridley**, and **James H. Dooley**, Executive Manager, Forest Concepts, LLC, Federal Way, WA

Forest Concepts is working under a federal contract from the USDA CSREES SBIR program to develop better methods to collect and transport woody biomass collected from small-scale fuels reduction projects (ranging from residential lots to 20 acre parcels) in the true wildland-urban intermix zone (WUI). Our specific objective is to enable more of the material to be diverted to value-added uses including energy, biorefineries, and engineered wood products. During 2005, we completed a Phase I study of the current situation in the western U.S. During Phase I, we conducted two surveys and a number of site visits with community wildfire protection organizations in Washington, Oregon, and California. We found that chipping biomass was costly, noisy, and produced very low-value feedstock. We propose to bale fine fuels and woody biomass into large rectangular bales for transport using existing recycling infrastructure.

### **Development of a Roundwood Distribution and Sales Program**

**Mark S. DeTray**, **David N. Lanning**, **James L. Fridley**, and **James H. Dooley**, Executive Manager, Forest Concepts, LLC, Federal Way, WA

Our objective is to develop a marketing and logistics business system that enables roundwood poles to become as common as 4x4 and 6x6 squarewood in landscape, rustic furniture, and outdoor applications. With support from the USDA CSREES SBIR, this project is developing knowledge and processes that enable us to deliver roundwood to consumers and contractors in the form of poles, roundwood components, and ready to assemble kits. Key elements of the marketing and logistics system include: 1) a marketing and sales program to educate consumers about roundwood – what the various types are, how to work with it, and creative ways to incorporate the look and feel of roundwood into homes and landscapes; 2) a products program that establishes specifications and quality standards for roundwood producers who supply retail markets under a common brand and distribution network; 3) a logistics program that coordinates production, inventory at producers, in-market distribution points and delivery to retail and wholesale accounts; 4) an overarching branding program that provides a coherent identity and expectation for consumers; and 5) a business enterprise whose success is dependent upon selling large quantities of roundwood into urban retail and wholesale markets.

### **Merchandizing Pulpwood in West Virginia: Attainable Lumber Yields Using Portable Bandmills**

**Shawn T. Grushecky**, Assistant Director, and **Curt C. Hassler** and **Timothy Pahl**, Visiting Scientists, Appalachian Hardwood Center, West Virginia University, Morgantown, WV

Previous research has shown that a tremendous amount of useable roundwood is left after harvest in West Virginia. In 2001, we found that 10.4 tons/acre of logging residue remained after harvest, most of it in useable form. The relatively large size of the logging residue remaining after harvest leads us to believe that increased utilization of this resource may be possible. Traditionally, many secondary processors use only higher grades of lumber, which have the highest yield of useable material and low waste. However, this comes at a high price. Conversely, at \$25.00-\$30.00/ton, loggers have been supplying EWP facilities in West Virginia with low-quality roundwood at a relatively low cost. If enough low-grade logs and bolts could be "harvested" from logging residues, it may be economical for companies to purchase low-grade residues, that were previously destined to be marketed to OSB plants or left in the woods, and convert them into value-added products. However, we do not know what product yields could be achieved through processing of this resource. To determine product yields, we procured pulpwood and merchandized it into shorter lengths to maximize the potential for value-added product yields. Each sub-piece was then characterized by species, volume, weight, and defect characteristics. Small log sub-pieces remaining after merchandizing were classified as firewood and weighed. Results from this research suggest that sufficient income can be generated by procuring pulpwood and sawing it into grade lumber and pallet stock, if species and size constraints are considered.

## Harvesting, Timber Product Output, and Mill Distribution: A Southern Perspective

**Tony G. Johnson**, Section Head, Resource Use-FIA, **Sonja N. Oswalt**, Forest Resource Analyst, **James W. Bentley** and **Mike Howell**, Resource Foresters, and **Carolyn D. Steppleton**, Statistical Assistant, USDA Forest Service, Southern Research Station, Knoxville, TN

The 13 states of the Southern U.S. contain only 1.7% of the global timber base, yet the South produces 18% of the world's timber products. Furthermore, forest industry and timber products contribute nearly \$100 billion (value-added) annually to the Southern economy. Consequently, harvest and TPO trends are a significant component of the USDA Forest Service Forest Inventory & Analysis program (FIA) in the Southern U.S. Three levels of resource data are required to provide reliable information on resource use and product output in the South. Timber removal data from FIA inventory plots are combined with timber product output data from forest industry surveys and utilization data from felled-tree harvesting studies to produce estimates of total harvest from the South's timberland. Data collected by the Resource Use section of FIA estimate that removals from the 13 states inventoried by the Southern Research Station total 12.2 billion cubic feet annually. Timber products comprise 71% of the total removals – enough volume to fill nearly 3,400 logging trucks per day in each of the 13 states. Trends in output are discussed, along with current harvest and utilization data, mill statistics, and mill distribution throughout the South.

## The Evaluation of Wood Residues and Woody Biomass in Virginia Utilizing GIS

**Omid Parhizkar**, Graduate Research Assistant and Ph.D. Student, and **Robert L. Smith**, Professor and Extension Specialist, Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, VA; **Charles W. Becker III**, Utilization & Marketing Manager, Virginia Department of Forestry, Charlottesville, VA; and **Robin Jones**, Energy Project Manager, Virginia Department of Mines, Minerals & Energy, Richmond, VA

The goal of this research was to collect information on the types, quantities, and location of wood residues and other woody materials produced in Virginia that could be available for use as bioenergy or other applications. Areas of interest would include materials from waste generated from forest products companies by SIC codes by County. Once the information is collected, it will be incorporated into a GIS format so that strategies can be developed that will utilize these materials, which should reduce wildfire risk, environmental concerns and wood waste, while providing management opportunities to improve the health and sustainability of the forests in Virginia. By identifying the location and quantities of various woody materials, this research will also have the potential to develop new markets and increase jobs in a number of rural areas. The GIS-based information will also allow for easier updates of information in the future. This research will provide valuable information toward the expanded use of bioenergy in Virginia.

## Woody Biomass Utilization – Scaling the Solution to Match the Resource

**Marcia Patton-Mallory**, Biomass & Bioenergy Coordinator, USDA Forest Service, Office of the Chief, Fort Collins, CO; **John C. Stewart**, Biomass & Forest Health Program Manager, U.S. Department of Interior, Office of Wildland Fire Coordination, Washington, DC; **Ed Gee**, Woody Biomass & Partnership Coordinator, National Forest Systems, USDA Forest Service, Washington, DC; and **Bryce J. Stokes**, National Program Leader, Forest Operations Research, USDA Forest Service R&D, Washington, DC

Ecologically and economically sustainable woody biomass utilization will result in more diverse forest, woodland, and rangeland ecosystems characterized by native flora and fauna, healthy watersheds, better air quality, improved scenic qualities, resilience to natural disturbances, and reduced wildfire threats to communities and provide an alternative waste management strategy contributing to rural economic vitality and national energy security. This begins with: 1) Increasing the reliability of an accessible and sustainable supply of woody biomass from National Forests and other federal, tribal, state, and private lands. 2) Improving utilization through maintaining and enhancing local infrastructure and developing new technologies, businesses, and markets capable of using low-value woody biomass. 3) Enhancing partnerships among woody biomass interests at the national, state, and local levels.

An integrated woody biomass strategy is identified through a Department of Energy, Department of Interior, and Department of Agriculture Interagency Memorandum on Woody Biomass Utilization, signed by the Secretaries in 2003. The purpose of this interagency effort is to increase the utilization of woody biomass and woody biomass products and residues from forest and woodland health, management, and restoration treatments whenever environmentally, economically, and legally appropriate. Additional key partners in this effort are Federal Agencies, the Western Governors, State forestry organizations, the Natural Association of Conservation Districts, and local governments. Success stories include increased use of biomass for heating schools, federal facilities, and municipal buildings; changing economics of biomass power generation with renewable energy credits; and diversification of wood products industries to right-size the solution to meet the resource options.

## Sustainable Forestry for Bioenergy and Bio-Based Products

**Daniel Cassidy**, Post-Doctoral Research Associate, Warnell School of Forestry & Natural Resources, University of Georgia, Athens, GA; **Chyrel A. Mayfield**, Research Associate, Department of Forest Science, Texas A&M University, College Station, TX; **Larry Biles**, Interim Director, Southern Forest Research Partnership, Athens, GA; **Darwin C. Foster**, Extension Program Leader, and **Jianbang (Jim) Gan**, Associate Professor, Department of Forest Science, Texas A&M University, College Station, TX; **William G. Hubbard**, Southern Regional Extension Forester, Southern Regional Extension Forestry, Athens, GA; **Ben Jackson**, Professor, Warnell School of Forestry & Natural Resources, University of Georgia, Athens, GA; **H. Michael Rauscher**, Research Scientist, Southern Research Station, USDA Forest Service, Asheville, NC; and **Tat Smith**, Professor and Dean, Faculty of Forestry, University of Toronto, Toronto, ON, Canada

In the 2006 State of the Union Address, President Bush set a national target of substituting more than 75% of our oil imports with local renewable biomass by the year 2025. This goal not only demands an increase in technological advances and efficient infrastructure, but also in educational opportunities for land managers, land owners, and various publics. The Southern Forest Research Partnership (SFRP), and its member institutions, has initiated the "Sustainable Forestry for Bioenergy and Bio-Based Products Initiative" to meet such an educational need. The objectives of the SFRP Initiative focus on synthesizing the current scientific and technical knowledge to produce a variety of informative products that range from the traditional extension paradigm to the more advanced hypertext Forest Encyclopedia and online learning centers. These products will be marketed as state and regional programs that will assist southern forest managers, community development leaders, and private landowners understand the complexities of biomass utilization and promote the adoption of such technologies in their area. The initiative will focus on five areas of concern within the southern region: 1) Silvicultural treatments for enhancing biomass production; 2) Harvesting of woody biomass; 3) Utilization of woody biomass for the production of energy and bio-based products; 4) Socio-economic impacts and community development; and 5) Developing environmentally sustainable production systems. With over 60% of the nation's timber supply and the production of the associated wood waste from harvesting and processing, the southern U.S. is primed to embrace biomass utilization. This initiative seeks to assist the southern rural communities in the South that are still heavily tied to forest products become major influencers upon our nation's fuel supply and national security through education and outreach experiences.

## Findings and Recommendations of the Pennsylvania Blue Ribbon Hardwoods Task Force

**Charles D. Ray**, Assistant Professor of Wood Operations, School of Forest Resources, Pennsylvania State University, University Park, PA; and **Keith A. Craig**, Executive Director, Hardwoods Development Council, Pennsylvania Department of Agriculture, Harrisburg, PA

As a major U.S. producer of hardwood lumber and secondary products, Pennsylvania has a significant stake in the profitability of the hardwood resource and its utilization. Recent inventory surveys confirm industry speculation that the resource is getting smaller and of a lower grade, with a shift in species. The Secretary of the Department of Agriculture commissioned a Blue-Ribbon Task Force to bring together key industry and governmental personnel to study the current situation in Pennsylvania and recommend what strategies the state might take to ensure a well-planned and executed forest management and utilization strategy with respect to the small-diameter, low-grade stems that represent a large and growing part of the state's timber inventory.

## **A Small-Diameter Log Building for the Forest Products Laboratory to Demonstrate Residential Scale Renewable Energy and Rainwater Harvesting Systems**

**Martin R. Yoklic**, Associate Research Scientist, Environmental Research Laboratory, University of Arizona, Tucson, AZ; **Steve Nicoll**, American West Structures LLC, Eager, AZ; and **Randy S. Nicoll**, Owner, Arizona Log & Timberworks, Eager, AZ

Forest products made from small-diameter lumber (SDL), harvested rainwater, and energy from wood waste and the sun are all plentiful and renewable resources. Using these resources effectively can provide a sustainable support system for cold climate housing by reducing our reliance on fossil resources (energy and groundwater), and making better use of forest resources. The technologies to harness and use these resources are being developed and require evaluation and testing in real world settings. This project is designed to demonstrate and validate that: 1) the combination of the Biomax wood pellet energy system with solar energy via photovoltaics can provide the majority of the power needs for a residential unit in a cold climate; 2) that rainwater can be reliably treated for portable use; 3) systems to save energy and water are safe, reliable, and provide sustainable security; and 4) these technologies are available and work well in cold climates like Wisconsin. The building, appropriately scaled to fit the site and complement the existing research demonstration house, will be the size of a contemporary two-car garage/workshop. This new building is of a scale and utility to demonstrate the technical feasibility of using small-diameter roundwood and other SDL building material and its potential for acceptance in the conventional housing market.

## **Fuels from Wood – Potential for 10 Percent of U.S. Energy Needs by 2025**

**John I. Zerbe**, Volunteer, S&PF Technology Marketing Unit, USDA Forest Service, Forest Products Laboratory, Madison, WI

The objective of this presentation is to show how 10% of U.S. energy needs could be obtained from wood available from unused, but otherwise sustainable, forest biomass inventory and forestry and wood manufacturing residues. It is estimated that 334 million dry metric tons of excess forest biomass per year are available now, and that by expanding productivity and accessibility this could be increased significantly. Obtaining 10% of our energy from wood is also dependent on conserving the total amount of energy consumed through measures such as fuel efficient vehicles, reduced size and more energy efficient construction and comfort conditioning of housing, reduction of consumption in areas such as packaging, and more recycling of resources. Efficient and advanced technologies in the areas of thermal energy, electricity, and transportation fuels from wood are highlighted. The most effective way to use biomass for energy is to combust it efficiently. Gasification is efficient and clean. Electricity from wood is an important pathway, and efficiency is improved significantly with cogeneration of heat and electricity. Transportation fuels from wood are headed by ethanol. Ethanol was given a boost with passage of the Energy Policy Act of 2005. Other likely possibilities are methanol and diesel. In the long term, hydrogen fuel may be opportune. An increase from 3% to 10% of our energy from wood to save fossil fuel will provide energy benefits including greenhouse gas reduction and reduction of sulfur emissions. The time to implement best technologies for obtaining energy from excess wood is now.

## **Harvesting and Transportation of Woody Biomass for BioEnergy**

**Rien Visser**, Associate Professor, Industrial Forest Operations, Department of Forestry, Virginia Tech, Blacksburg, VA; and **Raffaele Spinelli**, Head, Harvesting Research Group, CNR/IVALSA, Florence, Italy

Harvesting and transport costs are often greater than 50% of the total cost for woody feedstock delivered for bio-energy production. Selection of harvest system and logistical optimization are critical for a successful bio-energy program. Focus is not just on lowest cost harvesting and transportation, but also balancing biomass moisture content changes with season, extraction and processing, as well as storage considerations. Woody biomass may come from specifically grown crops such as poplar or as a by-product (pulpwood) from regular timber harvesting operations. There is also a potential abundance of woody biomass from untapped opportunities such as; the collection of in-woods post harvest residue using bundlers, chips from arboricultural activities, fire risk reduction harvests, or thinnings from timber stand improvement harvests. Agricultural equipment with minor modification has proven effective for harvesting woody biomass crops up

to 2 years of age. Standard forestry harvesting equipment only becomes efficient in larger tree diameters (>15cm). This poster presents an overview of specialized or modified equipment that has recently been trialed for the harvest of woody biomass in Italy. Data from European productivity studies provide a clear indication as to harvesting costs as well as show opportunities for logistical improvement.

## **Developing a Business Model for the Harvesting of Small-Diameter Timber for Private Landowners in Virginia**

**Joe Currie**, Graduate Student, and **Rien Visser**, Associate Professor, Industrial Forest Operations, Department of Forestry, and **Robert L. Smith**, Professor and Extension Specialist, Department of Wood Science & Forest Products, Virginia Tech, Blacksburg, VA; and **Charles W. Becker III**, Utilization & Marketing Manager, Virginia Department of Forestry, Charlottesville, VA

Virginia continues to have forest as its primary land cover (65%). Fragmentation driven by development has resulted in over 400,000 private people owning forest land in parcels smaller than 50 acres. In most areas, a century of poor management practices (such as high grading) have left the stands in poor health, susceptible to disease or increase fire risk. Improving stand health will require making a Timber Stand Improvement (TSI) cut, focusing on the removal of small diameter timber (SDT). The benefits of harvesting and utilizing the SDT are numerous. Thinning of forest stands can improve wildlife habitat, increase growth rates, produce income for the landowner, enable forest management objectives to be met, and decrease the risk of wildfires. Although SDT markets continue to develop, such as the bio-energy market, harvesting contractors struggle to economically harvest SDT for small landowners. In most cases the value of the SDT cannot cover the harvesting costs. For efficiency and safety reasons, logging equipment has gotten larger, and loggers are not geared towards providing harvesting services on smaller tracts. Conversely, the new forest landowners do not have a clear idea of how to achieve a successful TSI on their land. New solutions need to be developed. In cooperation with the Virginia Department of Forestry, this research project intends to develop a business model that will aid small forest landowners and loggers in the harvesting of small-diameter timber. It will investigate factors hindering the economical harvesting as they relate to harvest contractors of timber and the incentives necessary to increase the removal of SDT. The business model will include metrics by which a harvest can be evaluated, such as minimizing residual stand and soil damage, to ensure the logger will comply with the more complex objectives of most small private landowners.

## **Developing Niche Marketing Strategies for Products from Small-Diameter Timber – the Case of Natural Lump Charcoal**

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In larger (commodity) markets most customers have similar needs and products are generic. Finding markets for small volumes of small-diameter products is difficult and often requires a special focus or strategy. “Niche” marketing may help you add value to these products. These special, unique, one of a kind markets require marketing and management skills. We use charcoal made from small hardwood residue left from logging in Southwest Virginia as a case study to examine the possibilities of niche marketing. Identifying customers and devising product and promotional strategies for natural lump charcoal will serve as examples for other products from small-diameter timber.

## **Wood to Energy: Utilizing Interface Fuels for Bioenergy in the Southern United States**

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The southern area of the United States has the most cities with forests within 50 miles than any other region. It is also the fastest growing region in the United States, which has led to increasing areas of forest, intermixed with urban development. The proximity of working forests to these “wildland-urban interface” areas make them prime candidates

for utilizing woody biomass for energy production. The USDA Forest Service, Southern Center for Wildland-Urban Interface Research & Information and the University of Florida, School of Forest Resources & Conservation are developing a program to encourage interface communities in 13 southern states and Puerto Rico to use woody biomass for bioenergy production. The first goal of this program is to increase awareness and knowledge about energy production using woody biomass. The next goals are to use this knowledge to enable community leaders, potential woody fuel users, biomass suppliers, and forest managers to discuss the possibility of using woody biomass for energy in their region, and to provide resources to communities as they plan for this alternative energy opportunity. The first product from this program will be a USDA Forest Service General Technical Report (GTR). This GTR will be the basis for producing a curriculum manual and program materials for training of trainers workshops, community workshop series, a community support website, and satellite forums. Other partners in this project include the Southern Region Cooperative Extension Service, the Southern States Biobased Alliance of the Southern States Energy Board, and BioResource Management, Inc., a biomass energy firm in Gainesville, Florida.

### **Assessment of Red Oak Lumber Using Near Infrared Spectroscopy**

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Wood from small- or low-quality Eastern hardwoods is variable and thus potentially can be useful for a variety of high- and low-value applications. Rapid analysis of the basic properties of lumber sawn from such trees will be helpful in sorting wood into the most appropri-

ate products streams. A technology that has shown great potential for the rapid assessment of material properties is near infrared (NIR) spectroscopy. This method is advantageous because it can be used to estimate various material properties quickly and nondestructively. Its potential for predicting physical, mechanical, and chemical properties of softwoods has been described in several studies. NIR spectroscopy has been used to develop calibration equations for green moisture content and basic density of red oak. By using a proper range of NIR spectra, green moisture content and basic density can be predicted with good accuracy as shown by a coefficient of determination of prediction greater than 80%. It is concluded that with proper calibration, NIR spectroscopy can be used for a rapid in-line measurement of moisture content and basic density of red oak lumber.

### **X-ray Grading of Steam-Pressed Scrim Lumber (SPSL)**

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Steam-pressed scrim lumber (SPSL) and other engineered wood products (EWP) do not exhibit traditional defects found in solid wood products. Determining strength grades based on visual characteristics are impossible with EWP. This research describes our initial experience using x-ray technology to determine density variations and strength expectations in full-sized SPSL beams. Scanning technology, location of defects, and other inputs and their correlation with strength and stiffness properties of full-sized beams will be presented.



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